A Builder Looks at Home Air Conditioning.. Pg. 38

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Songer 'Amazed'

FTC Charges Crane Acquisitions Cut Competition, Tend to Monopoly

WASHINGTON, D. C. — The Federal Trade Commission charged recently that Crane Co., Chicago, has violated the antitrust laws by acquiring all or part of the stock or assets of the following five competitors within the past two years:

Chapman Valve Mfg. Co., Briggs Mfg. Co., National-U. S. Radiator Corp., Swartwout Co., Inc., Pipe Fabricators, Inc. (Crane also acquired a subsidiary of this company, Canadian Pittsburgh Piping, Ltd.)

(In Chicago, Wesley A. Songer, Crane president, said in a statement that he was "surprised and amazed by the complaint" and did not "see how Crane Co. is in violation of any Federal laws." See page 4 for the full statement.)

The FTC's complaint alleges the acquisitions violate the antimerger law, Section 7 of the Clayton Act, because their effect, individually and collectively, may be substantially to lessen competition or tend to create a monopoly in the production, distribution and sale of (1) valves and fittings; (2) plumbing fixtures and fittings; (3) heating equipment and auxiliary or related products; and (4) fabricated steel pipe.

The complaint further alleges that the acquisitions injure the public and are an unfair method

(Continued on Page 4, Col. 3)

What's Going On Here?

WHAT'S THIS? Putting in air conditioning with five inches of snow on the ground? Sanders Heating & Air Conditioning Co. of Detroit has been doing it at the rate of 1½ installations per week for the past month—a time when the ground has rarely if ever been free of snow. See complete story, page 16.

Row over Flexible Air Duct May Tie Up N. Y. Construction

NEW YORK CITY—A contempt-of-court citation was sought last week by a sheet metal contracting firm against Local 28 of the Sheet Metal Workers International Association which has struck the company over installation of flexible metal air duct for air conditioning.

The walkout was called against Triangle Sheet Metal Works, Inc. of New Hyde Park, L. I. It threatened to tie up what management estimated at $470,000,000 in construction.

Affidavits charging Local 28 with "deliberately violating a court injunction by instructing its members not to work" were submitted to the National Labor Relations Board by Herbert Burstein, lawyer for the company.

A temporary restraining

(Continued on Page 45, Col. 1)

One Shift Working Again at Carrier

SYRACUSE, N. Y., March 31—With some 70% of its hourly rated employes back at work, Carrier Corp. today was on a full-one-shift schedule of production in all departments despite continuing picketing by some members of United Steel Workers Local 5895. Company officials said a decision would be made soon on adding an extra shift.

The union had called a walk-

(Continued on Page 4, Col. 1)

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Buyers Are Puzzled
From Buffalo to Grand Rapids
De-Salting Sea Water, At Last?
Smiles from Glory Land
Gems from Our Mailbag
Stories of the Week
Last Gasps

Buyers Are Puzzled

What's happened to the Soaring Sixties? Obviously they haven't got off the launching pad yet. Quick diagnosis:

People expected too much too soon. All those optimistic predictions about the Sensational Sixties led too many trusting investors to believe that Jan. 1, 1960, automatically would birth a New Era of Prosperity.

It didn't happen, of course, because that sort of thing never does.

The N.Y. Stock Market plummeted (corrected itself, actually, for past over-optimism).

In consequence scores of businessmen have paused to take a second look at conditions.

Whenever the Stock Market falls out of bed, millions tremble. "Do THEY know something I don't?" even a prosperous business manager worries on his way to the bank.

As *United States News puts it:* "Expansion plans seem not to be so ambitious. There appears to be a tendency to wait and see."

From Buffalo to Grand Rapids

Recently "Dope" has had an opportunity to thermometer the "business temperature" in three scattered cities among three widely divergent groups.

Interestingly, all three diverse segments of our economy reported the same phenomenon:

Both industrial and consumer buyers are taking a "breather." They are "psychologically inactive."

In Buffalo we luncheon-spoke to a national convention of the Westinghouse Welding Equipment Div. In Detroit the Michigan Consolidated Gas Co. assembled 200-plus architects and consulting engineers to hear a discussion of opportunities and hazards in gas air conditioning. In Grand Rapids our topic was:

(Continued on Page 12, Col. 1)

Airtemp Sets Up 13 Parts Depots

DAYTON—Airtemp Div. of Chrysler Corp. has established a nationwide network of 13 parts depots to sell replacement parts to its distributors and their dealers, independent service companies, contractors, and industrial users.

Joseph B. Ogden, vice president of sales, said the major policy change was made "in order to improve and economize parts delivery." In the past, each Airtemp distributor ordered parts from the Dayton factory and in most cases maintained an extensive parts inventory.

Ogden said the depots would

(Continued on Page 45, Col. 4)

Residential Cooling Survey Finds Sales Up 24% In Knoxville

KNOXVILLE, Tenn. — Sales of residential air conditioning here last year jumped 24% over the total chalked up in 1958.

Another in the series of surveys made by the NEWS discloses a total of 447 residential installations here in 1959, compared with 352 made in 1958.

Great majority of these installations were heat pumps, there being 290 such systems installed in 1959, along with eight commercial heat pump jobs.

Data covering the 1959 sales activities was obtained from the same nine contractors and two distributors, as in 1958, whose combined installations probably account for at least 80% of the systems sold in the area.

A detailed breakdown of these firms' 1959 sales in both the residential and commercial fields is presented in the accompanying table.

This shows that there were 263 air conditioning installations in new homes at the choice

(Continued on Page 10, Col. 1)

Propose Standard for Homes Heated, Cooled By Electricity

By C. Dale Mericle

CHICAGO — A proposed "all weather comfort standard" for electrically heated and air conditioned homes that would establish recommended thermal performance values and insulation practices was announced to the trade at the first National Electric House Heating Symposium & Exposition here.

Developed by an unidentified group of utilities and manufacturers of air conditioning and heating equipment, insulation, and glass, the proposed standard is being submitted to numerous trade groups and manufacturers for their acceptance.

Announced purpose of the standard is:

"To encourage good insulation practice so the owner will benefit from:

"1. Lower first cost of both

(Continued on Page 6, Col. 1)

Western Show Will Open In Los Angeles Apr. 27; Predict Biggest Exhibit Ever

LOS ANGELES—Final plans are nearing completion for the Western Air Conditioning, Heating, Ventilating, and Refrigeration Exhibit and Conference scheduled for April 27 through 30 at the Shrine Exposition Hall here, and those sponsoring the affair state that the Exhibit will be by far the largest in the history of the event, and the conference sessions promise to be the most comprehensive.

All who are active in the air conditioning, heating, ventilating, and refrigeration fields are invited to attend the Exhibit and any of the Conference sessions, states William P. Tennity, Tennity & Co., president of the Western Air Conditioning Industries Association, sponsoring organization. On Wednesday through Friday, April 27-29, the Exhibit will be open from 1 p.m. to 10 p.m. On Saturday, April 30, the Show hours will be 10 a.m. to 6 p.m.

Technical sessions dealing primarily with application of equipment are scheduled throughout the four days. They will be under the direction of Arthur J. Hess, Western Industries Association vice president. The following sessions are planned:

April 27: 2:30 p.m. to 4 p.m. Panel on "Cooling Methods"; **April 27: 6:30 p.m. to 8 p.m.** Symposium on Fan Auxiliaries, with presentations on "Anti-Vibration Methods"; "Evaluating Motors"; "Drive Selections."

April 28: 10:30 a.m. to 12 noon Panel Discussion on Condensing Methods. **April 28: 2:30 p.m. to 4 p.m.** Symposium on "Testing and Balancing" with presentations on "Air Systems"; "Boilers"; and "Refrigeration Systems." **April 28: 6:30 p.m. to 8 p.m.** Panel discussion on "High Velocity Ducting."

April 29: 2:30 p.m. to 4 p.m. Temperature Control Clinic. **April 29: 6:30 p.m. to 8 p.m.** Symposium on "Piping."

April 30: 10:30 a.m. to noon (tentative) Specifications Clinic, with a discussion between a contractor, a supplier, and an architect. **April 30: 3 p.m. to 4 p.m.** "Hospital Air Conditioning" presentation by Arthur J. Hess.

Information on the Exhibit and Conference, and registration information, can be obtained by addressing Fred J. Tabery, Western Air Conditioning Exhibit and Conference, 3443 S. Hill St., Los Angeles.

Manufacturers' Compressor Shipments For 1959 Top Previous Year by 37%

WASHINGTON, D. C.—Manufacturers' shipments of compressor bodies reported to Air-Conditioning & Refrigeration Institute totaled 4,926,657 units in 1959, a gain of almost 37% over 1958 shipments of 3,597,075 units, ARI reports.

The figures do not include compressor bodies for use in household refrigerators.

Bodies for automotive air conditioning compressors for the year totaled 527,973 units, compared with 445,487 in 1958, ARI said.

Of the total shipments, 89.2% were sold by their manufacturers as compressor bodies, compressors, or condensing units, and only 10.8% in unitary end-use products.

Shipments to other manufacturers accounted for 83.7% of all shipments, with 16.3% moving as a result of sales to non-manufacturers, distributors, jobbers, dealers, and retail customers.

Shipment for the various size categories, and names of reporting companies, follow:

MANUFACTURERS' SHIPMENTS OF COMPRESSOR BODIES PRODUCED BY REPORTING COMPANIES

(Except for Household Refrigerators)

	Shipments Including Exports	
	Jan.-Dec.,	Jan.-Dec.,
*Horsepower	1959	1958
⅙ & under	695,608	1,199,364
⅓		
¼	884,487	
⅓	326,918	225,894
½	153,209	181,522
¾	99,706	69,565
1	1,164,683	713,464
1½	287,176	243,579
2	434,333	283,709
3	156,996	103,914
4	18,832	N.A.
5	96,829	68,810
7½	42,451	33,762
10	15,931	10,013
15	6,785	4,578
20	1,969	1,969
25	2,573	1,992
30	2,123	2,026
40	2,227	2,053
50	1,409	1,430
60	1,135	1,043
75	815	699
100 & over	608	461
Total	**4,396,803**	**3,149,847**
For auto a-c — Total	527,973	445,487
For ammonia refrigerant — Total	1,881	1,741
Grand Total	**4,926,657**	**3,597,075**

*For all refrigerants **except** ammonia (excluding units for automotive air conditioning).

Unless otherwise noted, this summary includes compressor bodies shipped by the reporting companies **regardless** of whether they were shipped separately or incorporated into a condensing unit or unitary end-use product (such as a self-contained air conditioner, display case, freezer, or commercial refrigerator). Shipments for export are included. Shipments for household refrigerators are not included.

In order to avoid duplication of reporting, shipment figures were requested only from companies that assembled the machined compressor casting with the components necessary to make a complete compressor or motor-compressor assembly.

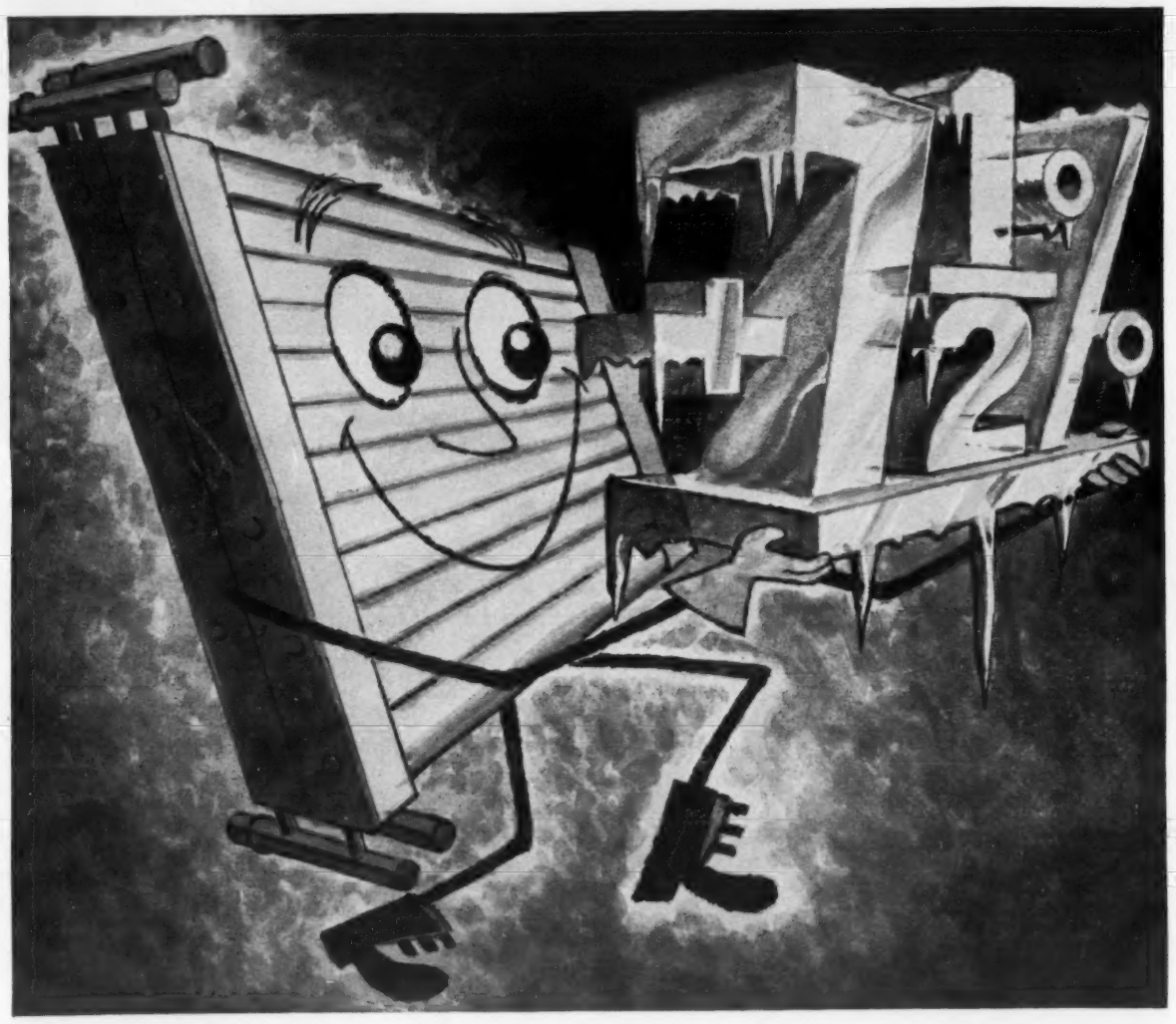
NOTE: In order to avoid disclosing the figures of individual companies, some data for two or more sizes are combined on ARI summaries.

N.A.: Not Available (figures for 4 hp. not collected in 1958).

Reporting companies: Airtemp Div.; Bendix-Westinghouse; Brunner Div.; Carrier Corp.; Copeland Refrigeration; Curtis Mfg. Co.; Frick Co.; †Frigidaire Div. (Jan.-Aug. only); §General Electric Co.; Kelvinator Div.; Lehigh, Inc.; Tecumseh Products Co.; Trane Co.; Vilter Mfg. Co.; Westinghouse Electric Corp.; Worthington Corp.; York Div.

†Report includes units for Automotive air conditioning only.

§Report includes units for Unitary air conditioning only.



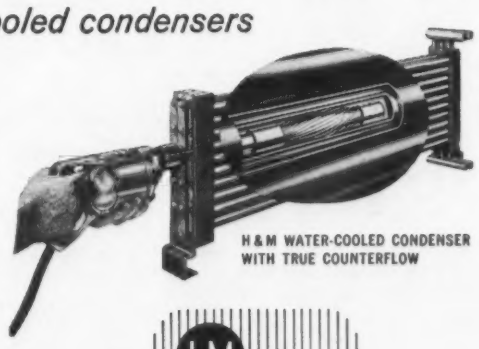
Want a 7½% increase in refrigeration capacity for the same horsepower?

Use Halstead & Mitchell cleanable water-cooled condensers

Test results indicate an average of 15 degrees of subcooling in H&M condensers because of true counterflow of refrigerant and water. Since liquid refrigerant leaves the condenser at a lower temperature, system capacity is increased about ½% for each degree of subcooling—without additional power input.

But that's not all: Halstead & Mitchell Water-Cooled Condensers have easily removable end plates for quick, safe, *mechanical* cleaning of the water passages. Scale and sludge are quickly removed so that condenser efficiency stays high; operating costs, low.

Featuring double-tube design, seamless copper tubing and brass headers, H&M condensers are available in ⅓ to 25-ton capacities. All are U/L approved, and can be used singly or in multiples on racks. Ask your H&M refrigeration wholesaler for complete information, or write Halstead & Mitchell Co., Bessemer Building, Pittsburgh 22, Pa.



H & M WATER-COOLED CONDENSER WITH TRUE COUNTERFLOW

HM Halstead & Mitchell

Air Handlers • Finned Coils • Air-Cooled Condensers • Cooling Towers • Water-Cooled Condensers

Tyler Plant Employment To Hit Peak of 750 by May 1, G-E Reports

TYLER, Texas—By May 1, employment at the Tyler plant of the General Electric Air Conditioning Dept. will be raised to a record 750 with the addition of 40 more production employes.

Plant Manager Tom Sproule noted that Tyler employment has risen steadily since its 1956 opening and attributed the rise to consumer demand.

The plant produces all of General Electric's central air conditioner and "Weathertron" units.

Can Chrysler Airtemp distributors play baseball?

Can they!
On March 21, opening day of our 1960 Sales Slugfest, they ordered air conditioning equipment at the rate of

A MILLION DOLLARS AN HOUR!

We pitched (more than 450 long distance phone calls) and our good distributors hit (over $10,000,000 in orders in one day). What teamwork! What a day! What a series!

To dealers everywhere this means that Chrysler distributors have a full line of fresh 1960 merchandise, are eager to do business, and are willing to be extra helpful. They're looking forward to a big year. You can be part of it.

We thank our distributors. Their confidence in Chrysler Airtemp products and their determination to make 1960 the greatest year in the history of the air conditioning industry are inspiring to every one of us.

Paul M. Cuzzi
PRESIDENT

Joe Ayden
VICE PRESIDENT, SALES

CHRYSLER AIRTEMP

Airtemp Division, Chrysler Corporation, Dept. H-40, Dayton 1, Ohio

Carrier Strike--

(Continued from Page 1, Col. 5)

out March 2 because of disciplinary action taken against some officers of the local union, who were inducing employes to refuse to work overtime. Last week the management, declaring that it had received indications that a majority of workers wanted to return to work, proposed a secret ballot to determine the employes' choice.

When the union turned down the vote proposal, Carrier issued a return to work call, and despite picket lines and some attempts to stop them more than 1,600 workers returned to work on Monday, March 28, over 2,000 on Tuesday, and by Thursday 2,276 out of a total of 3,251 hourly rated workers were back on the job.

The Steelworkers' local called a meeting March 29 at which reportedly less than 1,000 persons, many of them said not to be Carrier employes, were said to have voted for a continuation of a strike, but also to have requested a secret ballot among workers on the matter of continuing the strike.

However, in newspaper advertisements published in Syracuse today Carrier said that the "strike voted is already taken" because of the number who answered the back-to-work call.

Negotiations on a work contract, which were started at about the time of the walkout, have been broken off, and neither labor nor management has made any overtures to the Federal Mediation Service for a resumption of talks. The United Steelworkers was certified as the union to represent employes in an election earlier this year when it got 50.4% of the vote.

FTC Complaint Against Crane--

(Continued from Page 1, Col. 2)

of competition prohibited by Section 5 of the FTC Act.

According to the complaint, Crane is perhaps the largest manufacturer of a complete line of valves and fittings in the U. S., and is a significant factor in the other product lines adversely affected by the acquisitions.

In 1958, its sales exceeded $336 million and its products were handled by 1,312 independent wholesalers and by 175 company-owned branches throughout this country and Canada, the FTC said. In addition to manufacturing these various products, Crane distributes them for others on a jobbing or agency basis, the FTC added.

Specific actual or potential adverse effects of the acquisitions cited are these:

Chapman, National-U. S., and the Autronic Div. of Swartwout, Pipe Fabricators, and Canadian Pittsburgh have been or may be permanently eliminated as substantial independent competitive factors in their industries.

Briggs will either be eliminated as such a factor in its industry if Crane gains control or working control, or its competitive vigor will be substantially lessened or eliminated should Crane elect one or more members to its board of directors.

Crane's competitive position in these products or product lines has been or will be materially improved, to the actual or potential detriment of competition.

Actual and potential competition has been or will be substantially decreased or entirely eliminated between (1) Crane and the acquired concerns, and (2) wholesalers and distributors of the products or product lines.

Industry-wide concentration has been and may be substantially increased.

Crane has (1) materially strengthened its financial position, (2) increased, or will increase, its ability to arrange financial accommodations, to inhibit new producers from entering its markets, and to drive existing producers and distributors from its markets, (3) facilitated, or will have facilitated, its access to markets, and (4) increased the number and scope of technical and managerial skills available to it.

Songer Finds It Hard To Believe

CHICAGO — Wesley A. Songer, president of Crane Co., issued the following statement regarding the complaint filed against the company by the Federal Trade Commission:

"I have not had an opportunity to read the FTC letter of complaint addressed to Crane Co. in Chicago. I have, of course, been briefed by counsel and am surprised and amazed by the complaint.

"Every move by Crane Co. has been aimed at getting into a position where we can earn a reasonable return on capital invested in the United States—somewhat comparable to that earned on capital in Canada and England.

"Last year, for example, Crane earned less than 1% on the capital invested in its domestic valve and plumbing business. In 1958, we barely broke even.

"I find it hard to believe that the Federal Government as represented by the FTC would wish to hinder progress of a company in its efforts to make a reasonable return on its investment.

"Until I have had a chance to read the complaint thoroughly I cannot comment further except to say that I do not see how Crane Co. is in violation of any Federal laws."

What Was News 25 Years Ago?

Starting with this issue is a new feature "From the Files of the NEWS." Appearing on the editorial page, it will offer highlights of what was news in the industry in the corresponding week 25, 10, and sometimes 5 years ago. Also on occasion there will be items of industry news 50 or 60 years ago, this material being taken from the Recold Museum of the Industry Library.

This recording of the industry's history is not merely for the purpose of settling arguments and stirring up nostalgic memories among old timers. The references provided offer many possibilities for answers to problems in engineering, sales, and product development, labor situations, and some types of legal involvements.

Friends of
UCON IKE:
throw away your wrenches!*

NOW...EASY
HANDWHEEL
CYLINDER VALVES

...exclusive with
Ucon brand refrigerants

First Time Ever! Here's a handy new idea in refrigerant cylinders: a handwheel valve you simply turn to open, turn to close. No wrenches, no stripped threads. And, no leakage problems, because these new Ucon Brand Refrigerant valves are made without packing. There's nothing to adjust or maintain! They're yours on Ucon Refrigerant cylinders—at no increase in cost. *Ask Your Wholesaler Now* about Ucon Refrigerants—first with conveniences for refrigerant users.

* Or *keep* them if you like—they make great paper weights!

UNION CARBIDE product Ucon BRAND refrigerants — exclusive sales agent ANSUL

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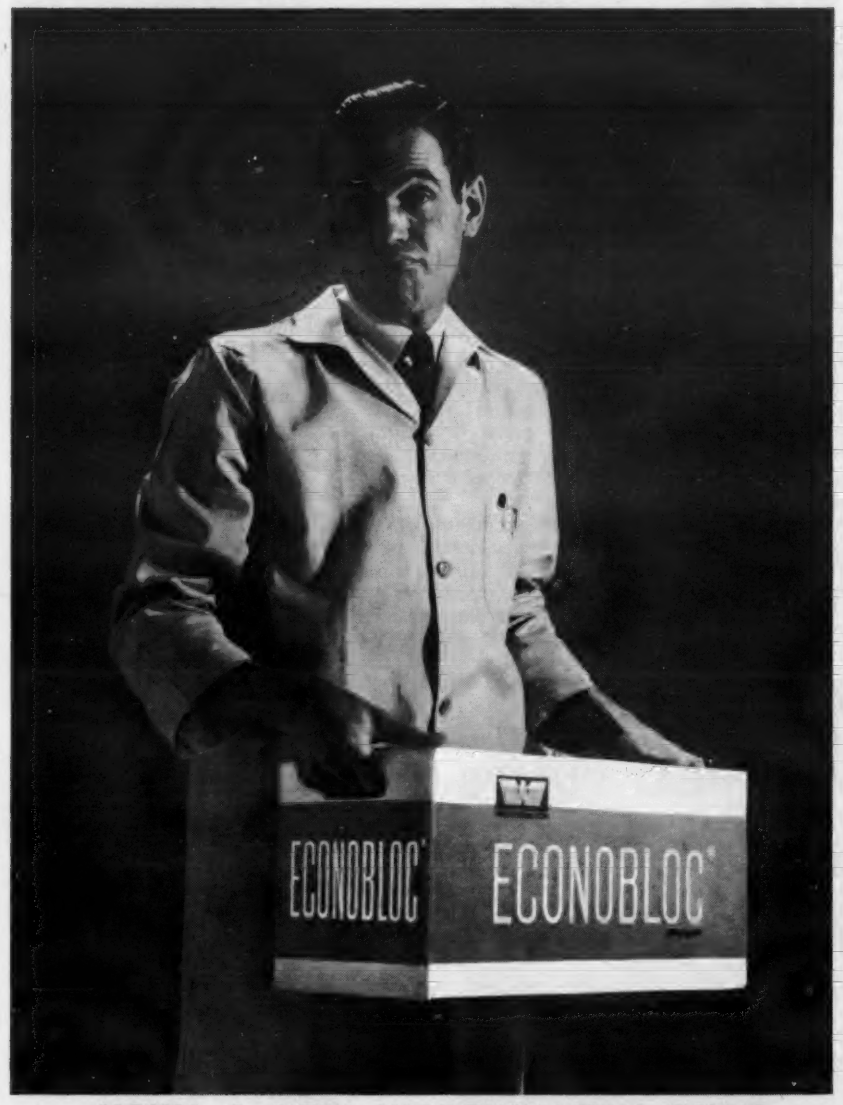
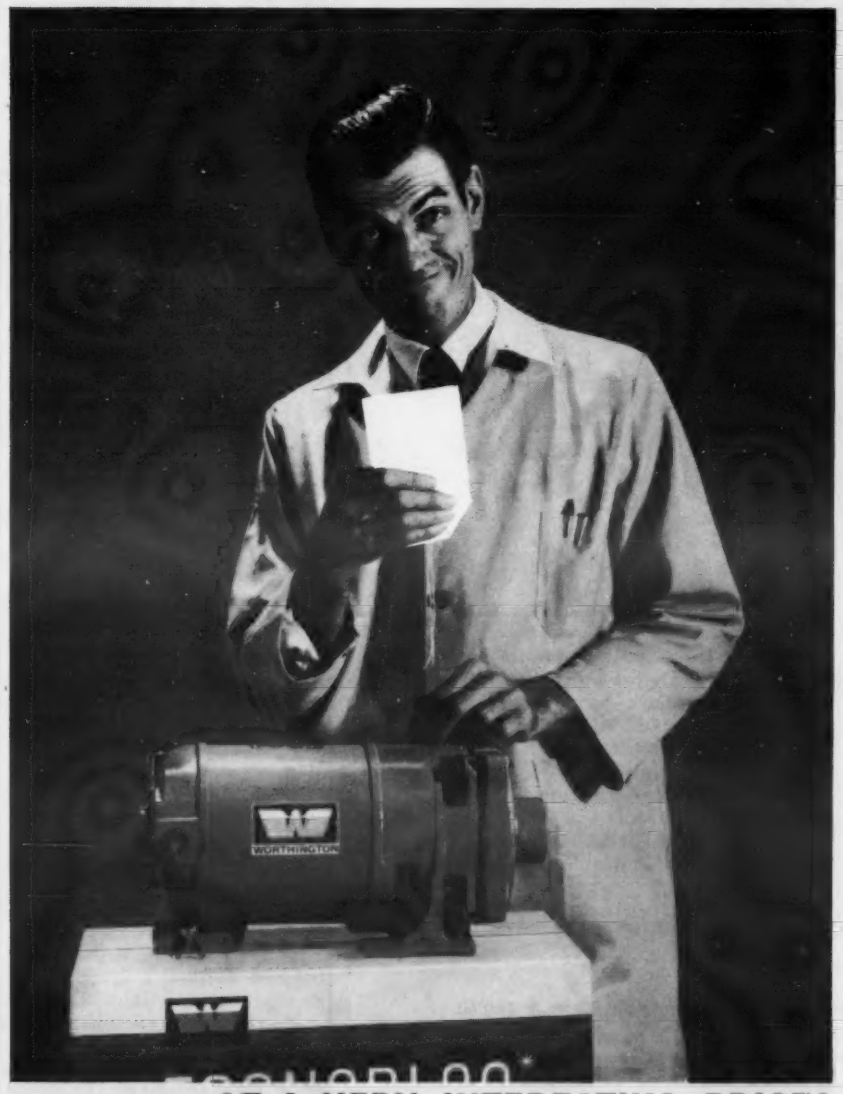


NOW! A NEW WORTHINGTON PUMP... WITH WORTHINGTON QUALITY...



AT A VERY INTERESTING PRICE!

THE NEW ECONOBLOC PUMP has been designed by Worthington to do just one thing: to give you a more economical installation.

The Econobloc pump gives you Worthington quality throughout . . . at a competitive price. You save money, too, because this new pump is carried in stock in 7 Worthington warehouses across the country (Roselle Park, N. J., Atlanta, Cleveland, St. Louis, Chicago, Houston and Los Angeles).

All prices are F.O.B. warehouse.

The Econobloc's packaging is a real time saver. The package is attractive, light weight and easy to handle.

After the pump is installed you can count on years of trouble-free life in the best Worthington tradition. In the rare event that trouble occurs, warranty service is provided from each regional warehouse.

The new Econobloc pump is stocked in 6 sizes in the fractional horsepower range that delivers up to 110 gallons per minute and 115 feet in head. Additional sizes go up to 7½ horsepower. For more information write to Worthington Corporation, Section 20-11, Harrison, New Jersey.

WORTHINGTON

'All Weather Comfort Standard'--

(Continued from Page 1)

heating and cooling equipment.

"2. Lower operating cost for both heating and cooling.

"3. Greater comfort for the occupants during both the heating and cooling seasons."

Objectives of the standard would establish:

1. Recommended thermal performance values for electrically heated homes.

2. Recommended maximum summer heat gain for air conditioned homes.

3. Responsibility for insulation quality and application.

Recommended heat loss values for electrically heated homes are listed in Table 1.

"When based on an infiltration rate of one air change per hour, the heat loss values in Table 1, which are expressed in B.t.u.h. per sq. ft. of floor area of the space to be heated to the comfort level, measured to the outside of exterior wall, will generally be achieved with the thermal performance values recommended in Table 2," the standard states.

The values in Table 2 are "as calculated in accordance with the method described in the current ASHRAE Guide, before correction for framing," it is explained.

The proposed standard also goes on to say:

"These values may need improvement in severe climates, when ceiling heat is used or when glass areas constitute a larger percentage of gross wall area than provided for in the establishment of the values.

"Weatherstripping, double glazing, and storm doors should be used as required to meet the values in Table 1 and for comfort and operating economy.

"It is recommended that infiltration, natural and mechanical ventilation, vapor barrier and slab on grade heat loss considerations be guided by the excerpts contained in the Appendix.

"It is recommended that sections between regularly and periodically heated spaces be insulated when the temperature difference between them is expected to be more than 20° F.

"It is recommended that fireplaces be provided with tight fitting dampers."

Regarding summer air conditioning, this position is taken:

"It is recommended that the total calculated heat gain to all space to be cooled to the comfort level not exceed 25 B.t.u.h. per sq. ft. of floor area of this space, measured to the outside of exterior walls, when calculated from the data contained in the current ASHRAE Guide.

It is recommended that consideration be given to shading glass areas by natural or mechanical means in order to minimize sun effect.

The recommended maximum heat gain value can generally be achieved with the performance values recommended in Table 2 when consideration is given to shading of glass areas.

Table 1

Degree Days	B.t.u.h./ Sq. Ft.	Watthr/ Sq. Ft.
Over 8,000	40	11.7
7,001 to 8,000	38	11.3
6,001 to 7,000	35	10.3
5,001 to 6,000	32	9.4
3,001 to 5,000	30	8.8
Under 3,001	28	8.2

Table 2

Building Section	U Value, B.t.u./(hr.) (Sq. Ft.) (F.)
Ceiling	0.05
Frame Walls	0.07
Masonry Walls	0.12
Floor over vented spaces	0.07
Floors over unheated basements	0.09
Slab edge heat loss per linear foot, 30 B.t.u.h.	

As for responsibility for insulation quality and application, the standard proposes:

"The insulation manufacturer shall be responsible for the quality of material and when required shall certify to its performance when installed in accordance with his application standards.

"The insulation applicator shall be responsible for installing the material in accordance with the manufacturer's recommendations and shall so certify when required."

More details of the standard are included in the accompanying appendix.

Appendix

Infiltration Heat Loss

Quoted from FHA Technical Circular No. 7, Revised August, 1959, "Heat Loss Calculations": One air change per hour may be assumed a reasonable average for estimating the infiltration heat loss. Infiltration values calculated on the basis of the "crack method" are considered acceptable, provided the result is not less than the equivalent of one-half air change per hour.

(Abstracted from FHA No. 300, Minimum Property Standards, including General Revision No. 1.)

Ventilation of Structural Spaces

Objective

To provide natural ventilation of spaces such as attics and basementless spaces to minimize the effect of conditions conducive to decay and deterioration of the structure and to reduce attic heat in the summer.

General

Net free area of an opening is the total unobstructed area through which air can pass.

Basementless Spaces (Crawl Spaces)

At least four foundation wall ventilators shall be provided, one located close to each corner of the space, having an aggregate net free ventilating area not less than 1/150 of the area of the basementless spaces; or

Ground surface treatment shall be provided in the form of a vapor barrier material plus at least two foundation wall ventilators having an aggregate net free ventilating area not less than 1/1500 of the area of the basementless space.

Attics and Spaces Betwen Roofs and Top Floor Ceilings

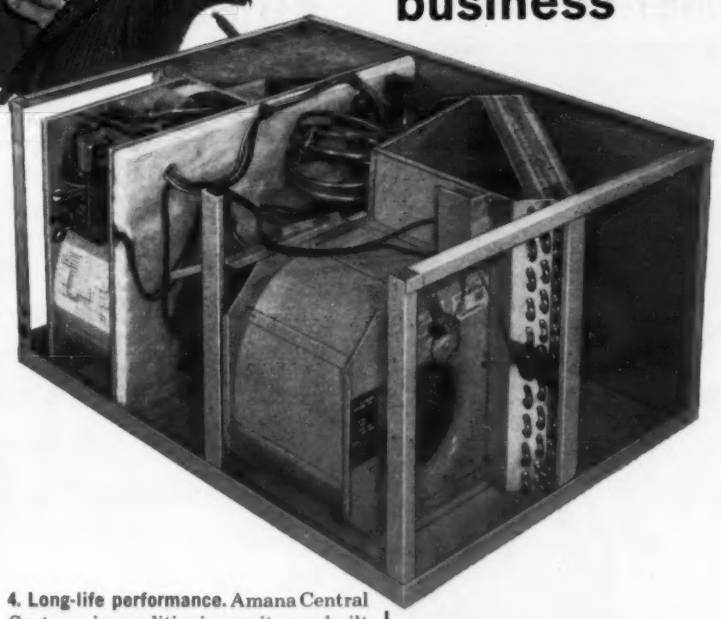
Provide cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow.

Ratio of total net free ventilating

6 REASONS WHY Amana

CENTRAL SYSTEM COOLING UNITS AND HEAT PUMPS

give you a more PROFITABLE FRANCHISE in the air conditioning business



1. A model for any installation, any climate. With Amana Central System air conditioning you satisfy the exact needs of the residential market, both new and existing homes, and most commercial applications. You select from a range of 2, 3, 4 and 5 ton units in package air conditioners, package heat pumps and remote air conditioners, both single and three phase. A wide selection of models help provide your customers with true air conditioning comfort—winter and summer—no matter what the climate.

2. One ton of cooling for each horsepower. Full capacity Amana Central System air conditioning systems are UL listed and certified under the new ARI Certification Program. Each unit is rated at 12,000 BTU/hr. or more per horsepower. This means greater performance at less cost, greater capacity in BTU per hour in both heating and cooling.

3. Quiet operation. Amana Central System air conditioning units are quiet by design . . . and by construction. Turbine blowers replace fans. Blower motors and compressor are cushion mounted. Inch-thick insulation and scientifically designed air path with large openings provide effective sound absorption.

4. Long-life performance. Amana Central System air conditioning units are built to last. Specially designed Amana-built coils and high quality components are pre-tested under rigid quality control . . . field tested for performance and long life.

5. Four-way rust protection. All interior and exterior steel parts are fabricated from rust-resistant (galvanized) steel; completely bonderized; and then given two coats of special formula Epoxy resin, baked-on enamel. The finest rust protection ever offered.

6. Easy to install at low cost. Amana units are designed and engineered to provide minimum field installation. Package units are pre-wired and incorporate an auxiliary drain connection; needs only simplest wire, drain, duct connections. Remote units have factory installed service valves, liquid line sight glass, and dryer. A new practical air flow design features in-and-out air flow from the same end of the unit. Requires minimum space and wide latitude of location.

FOR THE COMPLETE DETAILS ON AMANA CENTRAL SYSTEM AIR CONDITIONERS WRITE

Amana® BACKED BY A CENTURY-OLD TRADITION OF FINE CRAFTSMANSHIP

AMANA REFRIGERATION, INC., AMANA, IOWA

Amana Refrigeration, Inc.
Amana 14, Iowa

Please send me complete information on Amana Central System Air Conditioners.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

NEW

TAMPER PROOF TUBE PIERCING VALVE

MADDEN HP-41A

No handle discourages tampering. Operated by Allen wrench.

- Easiest to use, all in one piece
- V-block and lock nut combined in one unit
- Mounts in any position
- Cuts installation time

***General Purpose* VALVES**

New Madden Forged Brass Body valves for testing, charging, purging and other uses. Also available for panel mounting. Feature easy-grip handles and Teflon seats for positive shut-off.

See your **MADDEN** *Wholesaler*

MADDEN BRASS PRODUCTS COMPANY
AURORA 6, ILLINOIS, U.S.A.
EXPORT: Ad Auriema 85 Broad St., New York, N. Y.

Table 10-1—Slab Edge Heat Loss Factors

Heat Loss per Foot of Exposed Slab Edge, B.t.u.h.

Outdoor Design Temperature (°F.)	Total Width of Insulation (in.)	Value of F for unheated slab R=5.0	R=3.33	R=2.50	Value of F for heated slab R=5.0	R=3.33	R=2.50
—30 and colder	24	34	51	67	46	69	92
—25 to —29	24	32	48	64	44	66	88
—20 to —24	24	30	45	60	41	61	82
—15 to —19	24	28	43	57	39	59	78
—10 to —14	24	27	40	54	37	55	74
— 5 to — 9	24	25	38	51	35	52	70
0 to — 4	24	24	36	48	32	48	64
+ 5 to + 1	24	22	33	44	30	45	60
+10 to + 6	12	21	31	42	25	38	50
+15 to +11	12	21	31	42	25	38	50
+20 to +16	edge only	21	31	42	25	38	50

R = Thermal Resistance of Insulation.

Use F = 40 for unheated slabs or F = 75 for heated slabs, if perimeter insulation is not used.

* * *

area to area of ceiling shall be not less than 1/150, except that ratio may be 1/300 provided:

a. A vapor barrier having a transmission rate not exceeding one perm is installed on the warm side of the ceiling; or

b. At least 50% of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated (at least 3 ft. above eave or cornice vents) with the balance of the required ventilation provided by eave or cornice vents.

Mechanical Ventilation

Objective

To provide mechanical ventilation for bathrooms and kitchens not ventilated by natural means.

Bathrooms

Fan shall have sufficient capacity to provide a minimum of 12 air changes per hour.

Kitchens

Fan shall have sufficient capacity to provide a minimum of 15 air changes per hour in the area occupied by the kitchen.

Vapor Barriers

Walls

A vapor barrier shall be installed on the warm side of the walls when the "U" value of the wall is numerically less than 0.25.

Ceilings

Install on warm side of ceiling when a vapor barrier is provided.

Roof Deck

When roof deck material is also the finished ceiling, a vapor barrier having a vapor permeance of not more than one-half perm shall be installed near the warm side of the construction in areas having a design temperature of 10° F. or lower.

Concrete Slabs and Basementless Spaces

Maximum vapor permeance shall not exceed one-half perm for vapor barrier under concrete slabs and one perm for ground cover in crawl spaces.

Slab on Grade Heat Loss

Calculations of heat loss through concrete slab floors shall be made using the following formula:

H = F × P

H = heat loss of the floor, B.t.u.h.

F = heat loss coefficient, B.t.u.h. (Linear foot of exposed edge) from Table 10-1.

P = perimeter or exposed edge of the floor, linear feet.

Armstrong Furnace School Draws from 10-State Area

COLUMBUS, Ohio — Dealers from 10 states attended the first of two Armstrong factory air conditioning schools held in Columbus by Armstrong Furnace Co.

Carl Bryson, Armstron air conditioning service engineer, was assisted by Don Pabst in conducting the four-day school.

The school is designed to aid the beginner as well as the experienced installer in the applications of Armstrong air conditioning equipment.

"Those dealers attending learned about the refrigeration cycle, wiring, trouble-shooting, installation tips, and installation of the various Armstrong summer air conditioning equipment," it was pointed out.

"All those attending this school passed the difficult examinations and were awarded the Armstrong Furnace Co. Certificate of Accomplishment in Summer Air Conditioning Schools."

Cooling To Aid Quality Control

LYNCHBURG, Va. — General Electric Co. hopes to solve quality control problems in its Mountain View plant here with the July 1 completion of an air conditioning project costing several hundred thousand dollars, according to B. W. Saterlee, manager of employe and community relations.

Region X ASHRAE Conference Set for Fresno (Not Phoenix) May 6-7

SEATTLE — The annual regional conference for Region X of the American Society of Heating, Refrigerating & Air-Conditioning Engineers will be held in Fresno May 6-7, instead of Phoenix.

Charles L. Hall, director of Region X, said here that an unforeseen conflict with an important engineering meeting necessitated postponing the meeting at Phoenix.

He added that the board of directors has approved holding this year's conference at Fresno.

It is the tentative understanding of Director Hall that Arizona Central Chapter of ASHRAE would like to host the regional meeting of chapters in Region X at Phoenix in 1961.

The Puget Sound Chapter of ASHRAE would be agreeable to changing its hosting date to 1962 to conform with the postponed date of the Century of Progress Exhibition in Seattle.

The selection of the host chapter for 1961 will be an item on the Fresno meeting agenda.

Names and addresses of chapter delegate and alternate should be sent to John P. Lamborn, president of San Joaquin Valley Chapter, care of Valley Air Conditioning Supply Co., 1104 Parallel St., Fresno.

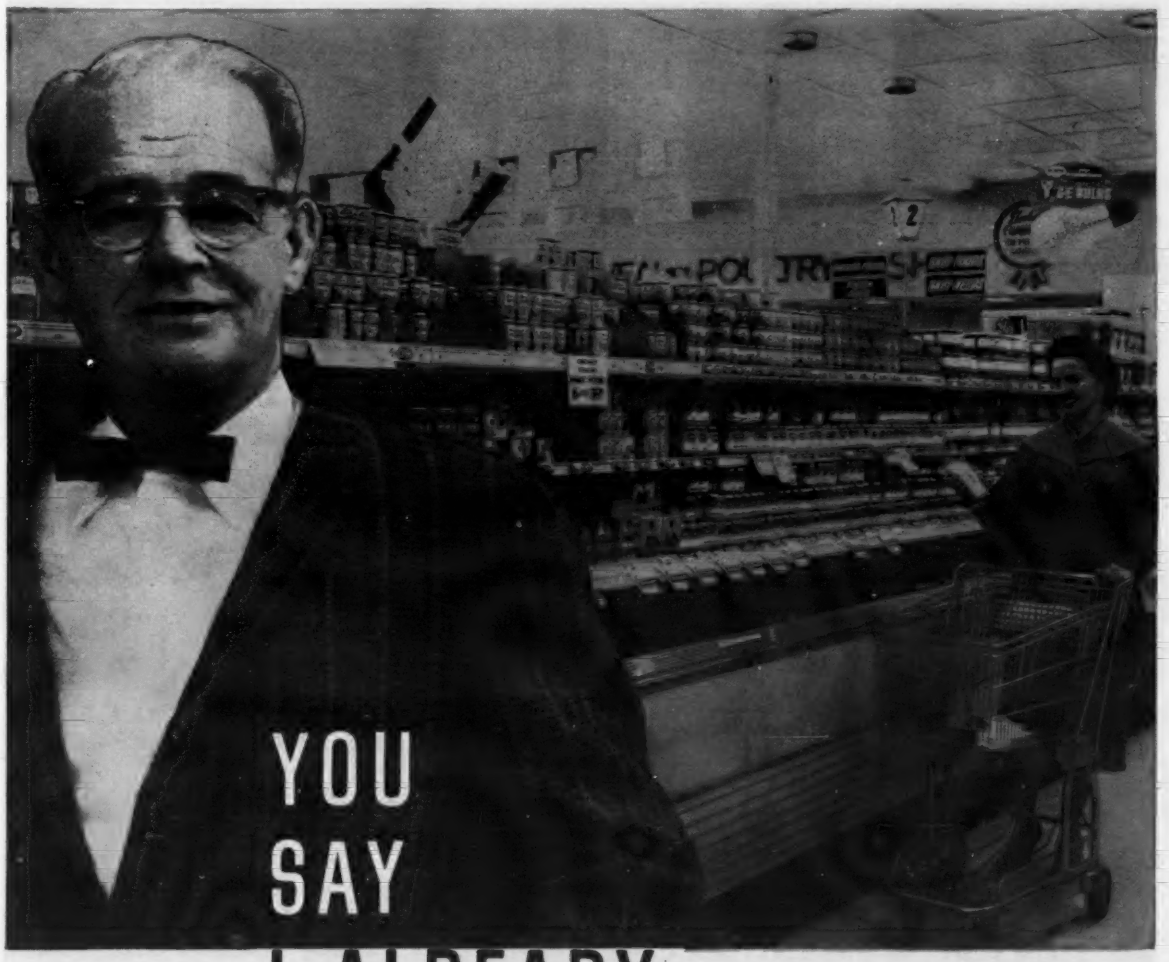
The Fresno conference will have two sessions, one each on Friday and Saturday mornings, speakers for the Friday luncheon and for the Friday afternoon technical sessions.

Millard Mayer, Koch Board Chairman, Dies Following Illness

KANSAS CITY, Kan. — Millard Mayer, chairman of the board of Koch Refrigerators, Inc., died recently after an illness of several months. He was 73.

Mayer was vice president of Koch from 1917 until 1923, when he became president, a post he held until becoming board chairman in 1953. It was under his direction that the Koch firm grew to its present position in manufacturing commercial refrigeration.

Mayer was a past president of the Commercial Refrigerator Manufacturers Association. In addition to his activity in the commercial refrigeration field, he was active in community service.



I ALREADY DEPEND ON TECUMSEH?

If you own a home refrigerator, freezer, or air conditioner there is a better than even chance that you have at least one Tecumseh compressor. That you are probably unaware of this fact is proof in itself of the quiet, trouble-free service you are getting. Equally efficient performance is available in Tecumseh's new line of commercial compressors and condensing units. Why not consider Tecumseh your next refrigeration opportunity?

forty million compressors in the field

TECUMSEH PRODUCTS COMPANY

MARION, OHIO
TECUMSEH, MICHIGAN

FOREIGN OPERATIONS DIVISION: Tecumseh, Michigan

CANADA: Tecumseh Products of Canada, Limited, 1667 Dundas St., London, Ont.

Some Candid Quotes on Electric Heat From Speakers at Chicago Symposium

CHICAGO — "FHA feels that as long as electric heat becomes acceptable to the public, it will not interfere with its progress," W. Beverley Mason, Jr., FHA assistant commissioner for technical standards, declared in a luncheon talk at the first National Electric House Heating Symposium & Exposition here.

Following are notable quotes from other speakers:

● "The electrical contracting industry, too, is changing as they note electric heating is their means of getting 7% of the builder's dollar, instead of their usual 2%.

"Even the air conditioning industry is changing, and liking electric heating, because it blends in so nicely with cooling to present a rather well balanced summer-winter load, utilizing electrical capacity on a year-round basis and hence improving their selling story to the prospective owner."—**C. F. Kreiser, general sales manager, Edwin L. Wiegand Co.**

● "Cable imbedded in ceilings has faced such a history of price-cutting and cut-throat competition that no segment of the industry can now afford to do the kind of job that should be done to properly promote this form of electric heat. In the quality market that must be developed for the future of electric heat, I question that this form will win out.

"Baseboard electric heat has begun a discouraging race to see who can provide the most capacity at the lowest cost, with the thinnest metal and the thickest paint to stand shipment and installation, and a pat with a prayer that it will retain its shape for the first year of operation. Unless quality considerations can be re-established in this form of electric heat, the future for it will be dimmed considerably."—**R. L. Boyd, product manager, Edwin L. Wiegand Co.**

● "I am proud to inform you that this coming June in Minneapolis we will feature a parade of six electric comfort-controlled homes that will have electric heating, cooling, humidity control, and air filtration . . . electric heating has finally arrived in the Cold North."—**France O. Anderson, technical consultant, Northern States Power Co.**

● "The cold days which produce the heaviest heating loads also increase the capacity of services, transformers, distribution lines, and outdoor substations far above their warm weather potentials." — **Leland Olds, director, Energy Research Associates.**

● "The only segment assured of their part in [electric heat's] future is the electrical utility. All other groups are interdependent. Even now, one of the largest manufacturers of warm air heating equipment is surveying electric heating and expects to market a competitive product shortly.

"Plumbing and heating contractors are studying the market, learning the product. Many say, 'When we think the time is ripe, we'll step in and take over. After all, electric heating is heating, and we are the heating industry.'" — **H. G. Blumberg, Cadillac Electric Supply Co., Detroit.**

● "Although our National Association of Electrical Distributors organization has some 1,100 member firms, there are many who are no deeper in the market than portables and bathroom units at present. This is quite frustrating to the manufacturer who wants to market through this channel and finds the door closed."—**Phil M. Furbay, Furbay Electric Supply Co., Canton, Ohio.**

● [With excessive installed capacity] "apparently what happens . . . is that air stratification occurs whenever the thermostat turns off the units. Stratification is not an instantaneous process, of course, but in a tight, well insulated home with infiltration at a minimum, there is little air circulation within the rooms unless the heating device is operating to cause a natural flow of air from the floor to the unit to the ceiling and back around again.

" . . . these problems call attention to the possibilities of all-electric central warm air heating and cooling systems and the known modifications and varieties. Americans are familiar with warm air systems and have learned to like them. The warm air industry has know-how and skill. When heat losses are intelligently controlled and the systems operated efficiently, customers can be satisfied."—**Robert M. Wood, Ebasco Services, Inc.**

● "Now what does the electrical contractor have to know in order to produce satisfied users of electric heat, that is, in addition to his basic knowledge of the installation of electric wiring and electrical equipment? He must . . . become a heating engineer. Proper insulation is the key to successful electric heating. The electrical contractor must therefore be completely familiar with all types of insulation and insulation techniques. He must be able to calculate heat losses."—**Charles Hart, technical editor, Qualified Contractor.**

● ". . . electric heat must at all times be clearly a part of the electrical specifications. Otherwise disputes, trade jurisdictional difficulties, and general confusion arise that damage the job, harm customer relations, and make our industry look ridiculous." — **Charles P. Bobe, National Electrical Contractors Association.**

● "In addition to being considered a blessing in itself because of the living comfort it provides in summer weather, cooling air conditioning might also be considered as being responsible, at least to a substantial extent, for the second of the twin blessings, electric heating, which is providing a similar degree of living comfort during cold months of winter.

"It is roughly estimated that for each five window type and each central type air cooling units on its system, an electric utility with a summer system peak can add one complete electric housing heating installation to provide a winter counterbalancing load."—**C. W. Cheatham, Alabama Power Co.**

CLIMB ABOARD THE PROFIT ROCKET!

Terrific "Operation Moonshoot" Zeroes in on Top Prospects for Air Conditioning! Terrific new program to thrust sales sky high! Join up and get these Typhoon benefits.

YOU CALL THE SHOTS!
Decide who you want to sell, and Typhoon backs you with products, pricing, sales know-how!

TYPHOON WORKS WITH YOU!
Its field reps are at your call for technical help, sales training and sales closing!

TYPHOON SELLS FOR YOU!
Its National Accounts Department is in constant contact with hundreds of nation-wide purchasers!

4 FINANCE PLANS!
Stretch your working capital; help you sell firms short of capital. A lease plan, too!

- Broad product line — a unit for every need!
- Customized units at mass production prices!
- Dealers' right-to-profit is a basic Typhoon policy! You make more per sale with "Operation Moonshoot."
- "Can't miss" advertising aimed at key men who make buying decisions, plus a practical co-op ad plan.

WRITE TODAY FOR MORE INFORMATION AND 20" X 28" REFERENCE CHART ON THE COMPLETE TYPHOON LINE.

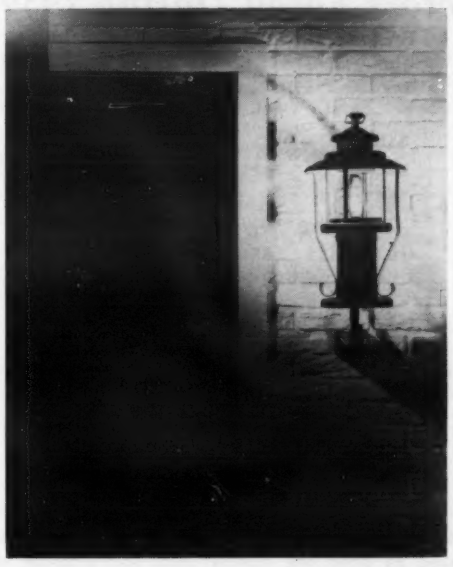
TYPHOON
DIVISION OF HUPP CORPORATION

TYPHOON AIR CONDITIONING DIVISION • Hupp Corporation
505 Carroll Street • Brooklyn 15, New York 1D

☐ Please send product literature and reference chart.
☐ Have your representative call for an appointment.

Name.....
Firm.....
Address.....
City..... Zone.... State.....

Coleman 'Gas-Lite' Glows for Sales



OUTDOOR GAS LAMPS such as this one will be given to purchasers of Coleman central furnaces, air conditioners, wall heaters, and floor furnaces during a nationwide promotion marking the company's 60th anniversary. Pole and post-mounted models for natural or LP gases are available in both mantle and open flame lamps.

* * *

Gift for Customers Marks Company's 60th Anniversary

WICHITA, Kan.—In celebration of its 60th anniversary, The Coleman Co., Inc., is announcing a nationwide promotion to build heating and air conditioning sales for its dealers and create additional year-round load for gas utilities.

The essential feature of the program is the gift of a Coleman "Gas-Lite" to purchasers of Coleman central furnaces, air conditioners, wall heaters, and floor furnaces.

An extensive sales promotion program, including mailing pieces, stuffers, give-away literature, radio and TV commercial, and consumer magazine advertising, has been prepared.

The new Coleman Gas-Lite originated in the Coleman "Boulevard" lamp manufactured during the early years of the company.

The modern version of the outdoor light is made in two styles. Model 1900-701 is a mantle lamp, complete with flow and shut-off valve for operation on piped, natural, manufactured, and LP gases. It mounts either on a post or wall.

Model 1900-700 is an open flame lamp that burns Coleman LP gas in disposable cartridges. It may be installed on a pole, post, or wall bracket or used as a portable outdoor table light.

Dunkirk Appoints James R. Cassidy Sales Manager

DUNKIRK, N. Y.—Appointment of James R. Cassidy as sales manager has been announced by Malcolm C. Reed, president of the Dunkirk Radiator Corp. here, manufacturer of cast iron boilers, ferrous and nonferrous radiation.

J. R. Cassidy

Cassidy has been associated with Dunkirk Radiator and affiliated companies since 1954.

Ship 290 Year-Round Units to AF Base

LEBANON, Ind. — Stewart-Warner Corp.'s Heating & Air Conditioning Div. was to begin shipment of 290 "Professional" gas furnaces and integral 3-hp. air conditioning components to Keesler Air Force Base, Biloxi, Miss., early in April.

General contractor for the job is Busboom, Rauh & C. E. Fritch, Dallas, and the mechanical contractor is Harrelson Corp., Phenix City, Ala.

The current order brings the manufacturer's total of air conditioning systems for military housing to 4,939 over the past 18 months.

In that same period Stewart-Warner has received orders for 3,633 furnaces for military housing installations. Locations range from North Carolina to Texas.

Middleton, Cummings Join Fedders As Regional Service Managers

MASPETH, N. Y.—In a further expansion of its field staff, A. F. Agovino, manager of customer relations and service for Fedders Corp., has announced the appointment of James P. Middleton and Pete J. Cummings as regional service managers.

The additions to the field service staff bring to seven the number of specialists that cover Fedders sales regions.

Middleton will cover the Pacific region which includes California, Washington, Oregon, Arizona, Utah, Nevada, and Idaho. His headquarters will be in Manhattan Beach, Calif.

Cummings, who will work from Parkville, Mo., a Kansas City suburb, will handle Colorado, Missouri, Nebraska, Minnesota, the Dakotas, Kansas, Iowa, and a portion of Illinois.

The new managers will be responsible for all activities related to the customer relations and service functions in their respective regions for all Fedders air conditioning products. Particular emphasis will be given to the Fedders line of central equipment.

Both men will report to Sil Thompson, Fedders field service manager.

Prior to joining Fedders, Cummings was in charge of the field training department of The Mathes Co. Middleton was formerly the manager of a local appliance service firm in California.

Ready to Roll on your Production line...

...COILED GM STEEL TUBING

Top refrigeration people depend on top tubing people

Coiling—available up to 2000 feet—eliminates unnecessary joints and short end waste—adapts most economically to modern production line techniques and provides better inventory control at less expense. Add GM Steel Tubing standards for quality, strength and cleanliness and schedule-meeting delivery service. You'll have the unbeatable combination that top refrigeration people know they can rely on. For detailed data write or wire GM Steel Tubing Sales Manager, *Rochester Products Division of General Motors, Rochester, New York.*

Precision Level Winding equipment produces level wound steel tubing coils. Accurate control lays each wind level with adjacent tube and insures precise coil dimension. This procedure insures easy adaptation to production line requirements at modest extra cost. Details on request.

GM STEEL TUBING BY ROCHESTER PRODUCTS

AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING

Knoxville Home Air Conditioning--

(Continued from Page 1)

of the builder; 41 systems installed in new homes at the choice of the buyer, and 80 systems that went into existing homes.

(Distributor B was unable, however, to supply any breakdown of the final application of either the residential air conditioners or furnaces he had shipped to his independent dealers.)

Heat Pump Sales Were High Because Knoxville Is In TVA Territory

As far as can be determined, virtually all the air conditioning systems sold to builders were heat pumps.

This should not be too surprising, considering that Knoxville is in the TVA area with very low power rates. Also, there can be expected a pretty fair balance between summer and winter requirements, which could make for an ideal application of the heat pump.

Heat pump sales would undoubtedly have been even higher in 1959 but for the fact that one firm deliberately avoided selling any.

"We had made quite a number of heat pump installations in 1958, and we wanted to wait a year to see just how they worked out," a company spokesman explained.

"We're quite satisfied with results now, so we expect to push heat pumps hard in 1960," he adds.

The data on residential heating sales in the accompanying table cannot be considered a true picture of the Knoxville market. Most heating sold in Knoxville continues to be electric heat with ceiling cable apparently still the predominant type.

Electricians Dominate Electric Heating Field

Except for heat pumps, most Knoxville contractors handling air conditioning do not get into the electric heating field, which is dominated by electricians.

Many of the residential heating installations listed went in with a cooling unit to form a year-round system. It should be noted also that in this table heat pumps are listed twice—once under "residential cooling" and once under "residential heating."

Contractor Activities In Commercial Field

Data is also given on the contractors' activities in the commercial field, both cooling and heating. The table shows a total of 125 commercial air conditioning installations and 91 commercial heating systems installed by these firms in 1959. Both of these totals appear to run well ahead of the 1958 figures for the same contractors.

Here again, many of the commercial heating installations were in conjunction with cooling to provide year-round air conditioning.

It could well be that these contractors' commercial air conditioning totals represent a fairly accurate picture of this field in Knoxville since there is not quite so much of the specialization often found in larger cities.

The breakdown showing percentages of dollar volume would also tend to confirm this supposition.

Only one firm, it will be noted (No. 7), derived most of its dollar volume from the residential field, and that primarily from heating.

Commercial air conditioning and heating were substantial sources of income for several firms, but the majority seemed to rely on "other" activities for the greater part of their dollar volume. Percentages in this category ranged as high as 94%.

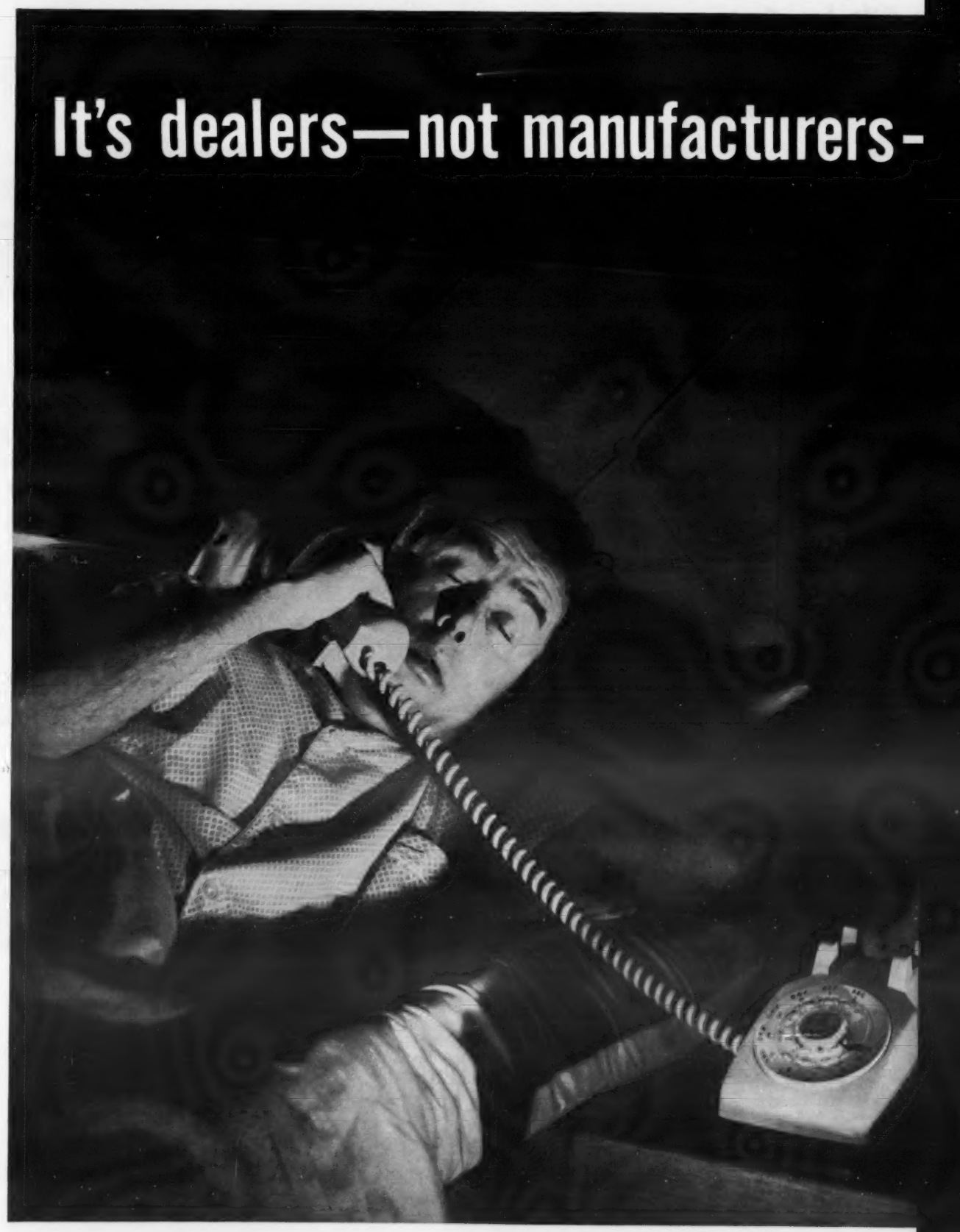
Fifteen different makes of air conditioners and heat pumps are numbered among the sales of the 11 firms with most con-

How Knoxville Residential Air Conditioning Contractors Fared During 1959

Contractor	Residential Cooling 1959 Total	New Homes Bldr.	New Homes Buyer	Exist.	Residential Heating New	Residential Heating Exist.	Commercial Cool.	Commercial Htg.	Percentage of Dollar Volume: Residential Cool.	Residential Htg.	Commercial Cool.	Commercial Htg.	Other
1	47*	44	....	3	44*	9*	3†	4†	—15%—		—15%—		70%
2	34*	12	17	5	27*	5	18*	8	—21%—		—29%—		50%
3	32†	12	5	15	18†	13†	25	21	21%	10%	43%	22%	4%
4	23*	....	2	21	2	10†	30*	22*	8%	4%	25%	10%	53%
5	12*	....	4	8	10	62*	18*	9*	NA	NA	NA	NA	NA
6	12*	3	....	9	3*	9*	22*	9*	—5%—		—16%—		79%
7	8†	2	....	6	3†	65*	2*	8†	8%	59%	1%	32%	....
8	6	....	3	3	6	9	7	10	5%	15%	10%	10%	60%
9	2*	....	....	2	2	9	....	....	1%	5%	.....	.....	94%
Dist.													
A	208*	190	10	8	180*	....	....	....	NA	NA	NA	NA	NA
B	63*	NA	NA	NA	—237†—		....	....	NA	NA	NA	NA	NA
Total	447	263	41	80	295	191	125	91	.....	.....	.....	.....	.....

*Up from 1958. †Down from 1958. Heat pumps (which total 290 residential and eight commercial installations) are tabulated as both one cooling and one heating unit in this table.

It's dealers—not manufacturers-



tractors installing more than one make. Only two contractors stuck solely to one brand. Both distributors limited their activities to one brand apiece.

No significant changes in distribution patterns over the preceding year was turned up in the 1959 survey. Six contractors, including the top four, buy from a franchised distributor, while the other three contractors listed buy direct from the manufacturer.

Five of the contractors do not maintain any stock purchased in advance of sale, but four others indicated they try to maintain at least a limited amount of equipment in inventory.

As for advertising, newspapers were mentioned most frequently as the media used, but the use of radio, television, direct mail, and telephone book advertising was also noted.

Most extensive advertising is probably the campaign of one distributor who runs a sizeable newspaper advertisement every other week consistently.

No special sales methods or "gimmicks" were turned up in the survey. Mostly, residential air conditioning sales result from personal contacts usually based on referrals from satisfied customers.

5-Day Toronto School Opens on April 4

TORONTO, Ont., Can.—April 4-8 are the dates set for the "summer cooling school" being sponsored here by the National Warm Air Heating & Air Conditioning Association.

To be held at the Seaway hotel, the classes will include several live demonstrations on air conditioning and cooling techniques.

Michigan Heating & Sheet Metal Auxilliary Considers What It Can Best Do To Help Contractor Upgrade Industry

GRAND RAPIDS, Mich. — Three talks devoted to selling and sales promotion were featured in a symposium—the chief event staged by the Michigan Heating & Sheet Metal Auxiliary in its annual meeting here March 9, just preceding the 49th annual convention of the Michigan Heating & Sheet Metal Association.

The group heard Milt Elert, assistant district sales manager, Michigan Consolidated Gas Co.; Lou Farber, sales promotion manager, Temco, Inc.; and Walter Blake, sales manager, heating and air conditioning division, Stewart-Warner Corp. E. J. Van Fassen, Temco representative, was moderator.

Comprised of distributors, wholesalers, and representatives of manufacturers, the auxiliary's chief concern in its business session appeared to be deciding what it can best do to help the contractor group upgrade the industry.

Considerable confusion and lack of direction seemed obvious in the discussion, however, but the consensus apparently was that the auxiliary should explore means of encouraging contractors to join and attend the annual convention of the contractors association.

Stanley W. Glenn was elected president of the auxiliary; E. J. Van Fassen, vice president; and Ed. Behm, secretary-treasurer. Directors include Wayne Smith, Blaine Lytle, Richard Pettinga, Clay Downing, and James Lesniak.

In his talk Elert emphasized the need to teach dealers how to sell, especially how to sell quality on a full-time rather than part-time basis.

"Customers want quality, but a lot of people don't sell it because they've never tried to," Elert declared.

"Nowadays customers don't complain, they just don't come back, and further, they tell others," he cautioned.

"Don't pre-judge customers," Elert also suggested, "and don't offer your lowest price first, because if that's too high, you have nothing left to offer."

Discussing sales promotion, Farber of Temco declared that a sporadic, hit-or-miss sales promotion program "is perhaps worse than none at all."

There are four important elements required in a good sales promotion program, he indicated. The dealer asks:

"1. Will it increase my sales?

"2. Will it increase my store traffic?

"3. Will it build my store name?

"4. Will it make my selling job easier?"

To conduct a good sales promotion program, Farber urged distributors "to hire or assign one man to this activity, provide an ample and definite sum of money for the purpose, drain your suppliers of their ideas, and create an interest among all your dealers in your promotional activities."

The need for good sales training was emphasized by Blake of Stewart-Warner.

"We try to teach our dealers how to sell our product rather than concentrating our efforts on selling our product to the dealer," Blake explained, "because when the dealers sell it there's only one place they can get it—from us."

Importance of glamorizing heating equipment was also stressed by Blake.

"You can have a burner element chrome plated or painted, and then display it before the customer on a piece of black velvet," he suggested.

It's very important, too, to "sell up," Blake also said. "Always give people a choice of buying something or something, not just something or nothing."

-who get called out at night

The manufacturer sleeps snugly—all night long—although the Smiths may call *you* at 2 A.M. Their furnace has stopped running, it's miserably cold outside—and the baby is sick. Who crawls out of bed, makes the hurried service call in the pre-dawn darkness? Not the manufacturer!

An awareness of this fact shapes the product and policies of Lennox. It's one of the reasons you, the dealer, are recognized as the most important person in the entire organization.

As a businessman—with plenty of problems of your own—you're entitled to the very best help and cooperation from your equipment suppliers. Lennox takes this responsibility seriously—and it's the heart beat of the direct factory to dealer relationship.

If you're not a Lennox dealer, find out now what you've been missing.

LENNOX Industries Inc.

Established 1895

Marshalltown, Iowa • Columbus, Ohio • Syracuse, N.Y. • Fort Worth, Texas
Salt Lake City, Utah • Decatur, Ga. • Los Angeles, Calif. • Des Moines, Iowa
Lennox Industries (Canada) Ltd. • Toronto, Montreal, Calgary and Vancouver

All New

HI-LO VALVE

IT'S ECONOMICAL BECAUSE THERE'S ONLY ONE SIZE!

Saves time and effort while charging or purging systems, or taking guage readings. Available from your local wholesaler. Write us for details.

HI-LO VALVE MFG. CO., INC.
P.O. Box 3262 Okla. City, Okla.

REPRINTS
SELLING FOR PROFIT.
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 1)

"Let's Put More Eat into Heat," before the Michigan Heating & Sheet Metal Association.

All three experiences (and the conversation that ensued) reminded us of the football coach who told reporters last September: "If any of my halfbacks make the first team I'm in trouble."

Perhaps that's our clue. The way to bust up this wait-and-see logjam is positive action. Everybody else seems to be wating for somebody else to bell the cat.

Now's the time to "hit the road." While other salesmen are waiting around for something to happen, we can make hay!

De-Salting Sea Water, At Last?

Next to disarmament and deflation, the most desirable international boon we should hope for next probably is desalinization of salt water.

Dr. Alexander Zarchin, a Russian refugee who has been working on sea-water desalting in Israel, and David Karr, president of the Fairbanks Whitney Corp. (which is promoting world rights for constructing his mechanism) believe they have a big bear by the tail.

Two Zarchin plants are scheduled to be installed this fall at Elath on the Gulf of Aqaba. Each will produce 500,000 gallons of pure water every day, at a cost of 40 cents per thousand gallons (same charge as for drawing fresh water from a well).

Thus far the biggest problem of desalinization has been getting cost of the process down to an equivalent of the *delivered* cost of fresh water.

Methods which have been tried previously — distillation, chemification, electrical membranes, and simple freezing— have cost from one dollar a thousand gallons upward (delivered).

Actually the Zarchin process does employ freezing—in which sea water becomes ice, and salts drop down into brine which can be removed.

Three key parts in the Zarchin apparatus—still held secret although the process is patented —permit salt water to be frozen with a much smaller input of energy than heretofore necessary.

"When we achieve full and regular industrial production," Karr states, "the cost of fresh water under this process should run only 20 cents a thousand gallons. Our goal for 1965 is to create enough plants to produce a billion gallons a day of fresh water throughout the world."

If that goal could be achieved, it would mean a life-saving and land-saving miracle for millions of hungry people throughout the world.

Water consumption in the U.S.A. alone is 250 billion gallons a day, and it probably will reach 600 billions by 1980. Moreover, our water problem isn't nearly so pressing as it is in other parts of the world.

Investment price of *building* a million-gallons-a-day plant, *running* it and *maintaining* it (over a 20-year period) would be only $600,000 to $700,000, according to engineers who have studied the Zarchin method.

Since announcement of its December, 1959, agreement with the Israel government, Fairbanks-Whitney has received inquiries from city and national governments all around the world, including Mexico, Jamaica, Libya, Hong Kong, Ghana, and a French bank representing the Sahara.

Take our word for it: Australia and Arizona will be heard from, too!

Fairbanks Morse, a subsidiary of Whitney, plans to manufacture the needed equipment at its plants in Beloit, Wis., and Kansas City.

Zarchin, now 62, innovated his first desalinization project in 1931. The Soviet Army used it in Turkestan desert areas. At that time he was high on the list of Russia's favorite sons.

Later the Soviets learned that Zarchin had registered another patent under the initials of a Zionist organization. Thereupon he was sentenced to the home of all Soviet fallen angels—Siberia.

He escaped, with his wife, to Israel. There he continued his work, and eventually handbuilt a pilot plant near Tel Aviv to test the new process.

By September, 1959, the process had been judged successful, and word went out to U.S. manufacturers through the American-Israeli Chamber of Commerce. It's now ready for the world. And it could transform the word as we know it.

Imagine! Deserts put to productive use!

Smiles from Glory Land

Following items are lifted happily from the Australian *Refrigeration Journal.*

"COOL CONSUMPTION: The owner of a new Goggomobile has had his tiny car air conditioned, and claims he is getting 40 miles to the ice cube."

"STRANGER THAN (SCIENCE) FICTION: By means of high frequency heating, British scientists have revived cats and dogs two hours after they were "killed" by lowering their body temperature far below normal. Is the day coming when chickens will arise in the electronic cooker, lay an egg and cackle?"

Gems from Our Mailbag

American Motors Corp.
Detroit, Mich.

Editor:

Back in 1940-41 the use of certain materials was limited because of national defense. One limitation was the number of aluminum ice trays that could be put into our refrigerators. In order to give a customer all of the ice trays which we specified for each model, we included a card advising the customer about the limitation and telling her we would send additional trays when they were available, i.e., after the war.

That was about 15 years ago, as you know. Tuesday of this week our Service Department received one of these cards from a customer who wanted what was due him.

I have enclosed a copy of the card and the envelope. A quarter accompanied the card as indicated on the copy.

The model was a 6.8-cu. ft. refrigerator with four cube trays specified, but only two were included in the original

(Continued on Page 15)

Are You Paying Premium Prices For Your Pipe Wrapping?

Now... cut costs, reduce inventories and *profit* more with the *one* standard insulation that fits every pipe and fitting, meets *every* service requirement!

THREE INSULATING BARRIERS in
NO Drip TAPE
1. OUTSIDE
Rough surface prevents free circulation of moisture-filled air — creates dead air barrier.
2. ¼-INCH THICKNESS
Built-in moisture barrier assures utmost insulating efficiency.
3. INSIDE
Dead air is trapped between "corrugated strands", forms added insulation barrier.

NoDrip Tape means more profit, less work on every job . . . saves you time, labor, material. NoDrip Tape eliminates most multiple wrappings needed with thinner wraps . . . inferior wraps.

Why pay more when you can buy the handy 16 foot roll of ¼" thick NoDrip Tape at less than half the cost of a roll of ordinary ⅛" wrapping . . . and *far* below the cost of pre-formed foam cellular insulations?

Next time an equipment cold line job calls for *permanent* protection against condensation drip, "sweating" or frost, insist on using NoDrip Tape. Stops rust and corrosion, too . . . holds temperatures more constant and increases the efficiency of the cooling equipment.

NoDrip Tape is pliable, cork-filled and completely self-adhering. Easy to work with . . . forms an air-tight, 100% vapor and moisture proof jacket. Needs no tools, vapor seals, fasteners, brads or adhesives.

NO DRIP PLASTIC COATING... PROTECTION FOR BIG AREAS

For large pipes, tanks, air ducts, we recommend NoDrip Plastic Coating for permanent protection from condensation, rust and corrosion. Another fine Mortell refrigeration product, NoDrip can easily be applied by brush or trowel to metal, concrete, brick, plaster, tile or composition surfaces.

Easier to Apply...

EVEN AROUND JOINTS, TEES, VALVES OR ANGLES

Mortell COMPANY

Makers of Mortite Caulking Cord and Mortite Caulking Gum

J. W. Mortell Company, Dept. 3
520 Burch St., Kankakee, Ill.

O.K.! Send me full information about the complete line of Mortell refrigeration products.

I'm a Jobber____ Dealer____ Serviceman____

Name____

Firm____

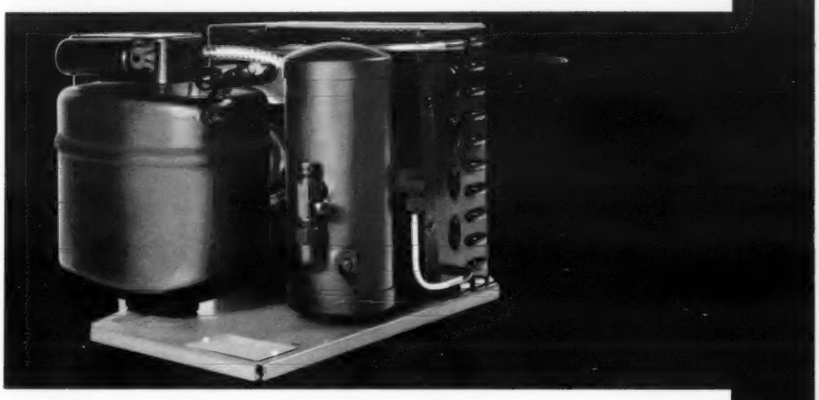
Address____

City____ State____

OUTSTANDING IN ANY COMPANY. Every bit as much painstaking effort and care is lavished on the design and construction of Bendix-Westinghouse compressors and condensing units as is spent on any other masterpiece. Don't take our word for it. Ask any of our customers. They'll tell you the same thing. Why not look at information about a new Bendix-Westinghouse condensing unit on the back of this page and see how this compact, efficiently designed unit can fit into your business picture.

Bendix-Westinghouse MOTOR COMPRESSORS

NEW BENDIX-WESTINGHOUSE CONDENSING UNIT DESIGN SAVES WEIGHT, SPACE AND COST!



The latest Bendix-Westinghouse development in ¼-h.p. condensing units, Model BRYH25-1, makes welcome news for manufacturers of commercial cooling equipment using expansion valve systems.

This Bendix-Westinghouse condensing unit outperforms bulkier, heavier assemblies—yet it ships at lighter weight, occupies less space in standard-size cabinets, and provides more cold capacity area in the refrigerated compartment.

Heart of the condensing unit is the Bendix-Westinghouse "Oval-Line" motor compressor. Its two-pole motor is lightweight, small, and low in cost—an appealing combination of efficiency and economy.

Manufacturers designing these units into their cooling systems can be fully confident of their performance and dependability. They have the latest kind of motor insulation, inherent overload protection, full suction gas cooling, positive pressure lubrication and glass terminals. And they are quiet as a breeze!

Whether or not you now use fractional horsepower compressors or condensing units, it will pay you to get complete information on these quarter-horsepower developments. Write direct.

Bendix-Westinghouse

EVANSVILLE, INDIANA

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio
Export Sales: Bendix International, 205 E. 42nd St., New York 17, N.Y.

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 12, Col. 5)

delivery. Apparently the card was kept in a safe place; it was just as good as new when we received it.

FRANK A. BUTTLER

Foreign Distributors Div.-GMC
New York, N. Y.

Editor:

We received the attached clipping from the *Manila Times,* sent in by Mr. Alex W. Baer, Frigidaire Manager of our distributor organization in Manila, Philippines Islands.

As a member of the Frigidaire Division in New York, we thought the enclosed clipping would really spell out what is meant by "red tape."

As we see it, somebody goofed by not sending an order to Manila for a casket to be shipped to Hawaii in order that they could re-ship the casket and body back to Manila duty free.

In the event our distributor informs us as to how this matter came out, we will advise you accordingly as, undoubtedly, all your readers will certainly wonder whether or not the man finally got buried.

A. HERMANSEN,
Frigidaire Sales & Service

"A legal technicality is delaying the release from customs and the burial of a resident of Talisay, Cebu, who died in Hawaii.

"Customs officials are asking the relatives of the dead man, Maximiano Antero, to pay a special import tax of P58.69 on the foreign-made casket containing the body.

"The relatives said that they are too poor to pay the amount. They asked that for humanitarian reasons the body be released so that it could be properly buried.

"Customs Collector Florencio Espino said he could not decide the matter because the metal casket containing the body, under the law, is classified as an imported article.

"Friends of the dead man raised money so that the body could be sent to Cebu. Antero died three months ago. Residents of this city have started a fund drive to pay for the customs levy."

Stories of the Week

Bachelorette phoned her laundry.

"You sent me four pairs of men's sox," she complained, "and I'm not even married."

"O.K., lady," came the answer. "We'll send a man out right away."

Texan departed this Earth, and found himself in his eternal home.

"Why," he chortled, "Heaven looks just like Texas."

"Brother," grimmed the Keeper of the Sticky Wicket, "this isn't Heaven."

Last Gasps

If you don't like April weather in the north, go south; if you don't like July weather in the south, go north; if you do like the weather any time, any place, go to the head of the class.

John MacLeod of General Electric sent short notes to 70 secretaries. With these notes went a report he wanted their bosses to read—and one earring.

The note offered another earring if Mr. MacLeod's goal was achieved. It was. All 70 saw to it that their bosses read his report.

'Dart for a Dollar' Campaign

Ogden Announces Airtemp Plans for '60, Plan To Up Airtemp's Room Unit Share

DAYTON—Vice President of Sales Joseph B. Ogden recently outlined the 1960 sales promotion campaign for Airtemp Div., Chrysler Corp., including what is said to be one of the air conditioning industry's most unusual plans.

The campaign is further aimed at increasing Airtemp's share of the room air conditioning market, which expanded 276% in 1959.

Backbone of this year's promotion will be the "Dart for a Dollar" campaign, whereby an Airtemp room air conditioner dealer can purchase a 1960 Dodge Dart for one dollar.

"We've simplified the Dart contest and all a dealer has to do after placing his required room unit order is to contact his Airtemp distributor, order the kind of Dart car he desires, and then sit back and wait for delivery in two weeks," Ogden announced.

Ogden said any dealer can obtain additional information from the Airtemp distributor in his area on the "Dart for a Dollar" program, as the program varies in each area.

Other sales promotion plans for Airtemp dealers include a two-unit room air conditioner display stand with an added attachment for mounting a casement unit; a new clock for the retailer's name identification; four-color product folders and specification sheets; the "Profit Planner," a tabloid publication giving dealers sales suggestions and ideas; and a "Profit Kit."

Series 271 single pole and Series 1273 two pole dual function. Temperature models available.

Below . . . Series 270 single pole and Series 1272 two pole single function for either low or high pressure. Also temperature models.

YOU CAN DO MORE JOBS WITH LESS CONTROL INVENTORY!

Penn's line of refrigeration controls has the capacity and versatility to satisfy all cooling requirements! Single or double pole models are available for all types of applications and are rated to handle single or polyphase motors from 1 through 5 H.P. capacity!

And, you get real economy, too. The two pole heavy duty models eliminate the need for motor starters when used on polyphase motors with built-in overload protectors. With their two separate circuits, these models are really 2 switches in 1. Don't settle for less . . . ask your wholesaler for Penn Controls!

PENN CONTROLS, INC. Goshen, Indiana

EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

Add-on Cooling: One Job *by* One Man *in* One Day

Detroit Contractor, Who Installed about 100 Units Last Year, Tells How He Saves Many Hot Weather Sales with Fast Action

NEWS Photo Story
By George M. Hanning

THERE MAY BE five inches of snow on the ground, but here comes an air conditioner from Sanders Heating & Air Conditioning Co. T'is the company's boast that a remote air-cooled air conditioner for a home can be installed in one day, largely by one man.

* * *

DETROIT—"Sign this order tonight and you will have cooling in your home by 4:30 tomorrow afternoon."

That promise—given in earnest—has convinced many a sweltering sleepless Detroiter to take pen in hand, heave a relieved sigh, and scrawl his signature on the order guaranteed to bring him comfort within 24 hours.

Ability to keep that promise has put Sanders Heating & Air Conditioning Co., though not a large organization, among the front ranks of residential air conditioning contractors in the Detroit area.

Morris Stein, sales manager, asserts that Sanders sold and installed about 100 residential air conditioners last year. That's more than any other contractor in Detroit, he believes.

Samuel Rainson, supervising engineer, confirms that 50 of these installations were each completed in ONE DAY, essentially by ONE MAN.

"Being able to make a good, clean installation fast is an important asset for any firm selling residential air conditioning," Stein comments, "particularly, you understand, in an area such as Detroit.

"As in most other northern areas, hot nights are still the most important factor in selling home air conditioning. If we get an early hot spell, we will have a good sales year.

"In Detroit, the comfort cooling season is comparatively short—maybe 40 to 50 days when the temperature and humidity are high enough to be uncomfortable. Generally, you get two or three hot days and then it cools off.

"When it gets hot, people want air conditioning—and they want it now. If they order cooling and don't get it for several days—and in the meantime the weather turns cool—they start cancelling their orders.

"Like I say, with a short season, every day lost installing units is a chance to lose a sale.

"We avoid this as much as possible by being able, with only five installation men, to put in

TOM GANTZ UNLOADS his truck. He brought the unit and all other materials needed for the installation, including the welding rig.

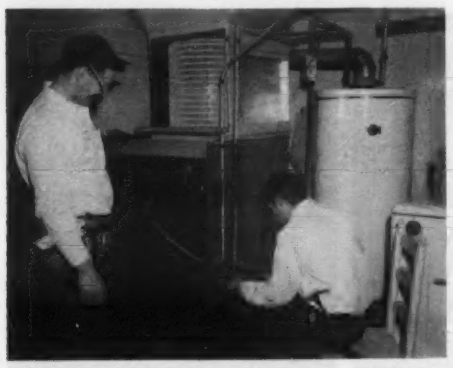
GANTZ AND AL KELLER, installation man, uncrate the condensing unit and set it up. Gantz carefully removes shrubbery.

Mr. Donald P. Green, mechanical contractor for Detroit's new Roostertail Restaurant, says:

"Honeywell came through answer to

Mr. Frank Lynch of the Roostertail and Mr. Donald P. Green (right), the mechanical contractor for Detroit's luxurious Roostertail Restaurant, discussing the Honeywell temperature control installation.

When Electrician Finishes . . .



AFTER CUTTING into plenum and setting coil in place, Keller watches Ed Marentette of Marentette Electric Co. remove electrical conduit that is blocking his way. Installation has proceeded far enough so that Marentette can wire unit and install thermostat while Keller does work in succeeding pictures.

End Cover Goes On...

KELLER FABRICATES new end piece and fits it over the coil. Panel on front of unit gives access to coil for servicing. Most sheet metal work is done in the shop before the job starts.

Motor's Changed . . .

TO OVERCOME added resistance of coil, Keller removes ¼-hp. furnace blower motor and replaces it with a ½-hp. motor. He also changed the pulley.

New Air Openings Cut . . .

CLOSED-IN PORCH added problem to this installation. It was heated by a wall heater and not connected with furnace. So Vic Fenn, another Sanders installer, uses power saw to cut holes for three floor diffusers under windows.

* * *

five remote, air-cooled air conditioners a day—in the 2, 3, and 5-hp. range, you understand."

How does Sanders do this?

"Close coordination and supervision, good training so that each man knows how to do everything necessary to complete an installation, and daily practice. That's about the nuts of it," observes Rainson.

"There is no secret to it," he adds. "The men are installing this equipment every day. They soon learn just what steps to take in what order to get the job done quickly and efficiently.

"While each job is different and may pose special problems, they become so familiar with their equipment that they quickly determine what must be done to overcome the particular obstacles that face them.

"They also carry on their specially-designed trucks everything they could possibly need to complete the installation. They never have to come back to the shop for anything.

"When they need something they don't have on the truck, they just call the office and we get it to them immediately. They don't waste any time.

"If there is any secret," he added, "it is that one man can do everything. He doesn't have to wait for other trades to complete their assigned work."

What is the routine Sanders follows to get its jobs done so quickly? Here is the way Stein described it.

After the order is signed, the salesman determines just what equipment and materials will be needed to do the job. He has already, of course, determined heat load and sized the equipment.

He makes out a work order and turns it over to the supervising engineer. Rainson arranges for fabrication of needed ductwork, boots, elbows, plenums, etc. in the company sheet metal shop. He takes out all necessary permits and notifies the electrician that a job is being started.

The electrician is the only tradesman not under Sanders' roof. The company is licensed for plumbing, heating, refrigeration, and sheet metal, but not electrical work.

"For us, it is not economical to have our own electrician," Rainson explained. "We can subcontract our work for what we would have to pay a man of

(Continued on next page)

with the perfect
our control problem!"

Designed and built by W. D. Gale, Inc. Architectural consultant: Edward Newman, Mechanical contractor: John E. Green Co., Mechanical consultants: John Harju & Assoc., and Ed Siegel

A Honeywell Control Master Panel provides one-man control of all seven comfort zones at Roostertail Restaurant

"The restaurant manager," says Donald Green, "wanted the opportunity to adjust temperatures separately in each of the seven zones, because each has a different comfort environment and use. Now, with Honeywell's Control Master Panel, he can adjust the comfort level in each zone from his office." According to Mr. Green, "It has been proven to me many times that Honeywell solves problems like this easily with exactly the right equipment and careful planning."

Roostertail Manager Lee Schoenith says he saves a lot of time checking temperatures—especially during peak serving hours. Mr. Schoenith reports: "With Honeywell controls and Control Master Panel, we have no problem keeping our customers happy with consistent, comfortable temperatures."

You get more to work with when you work with Honeywell. Easily installed controls, accurate specifications, prompt delivery and excellent supervision are the advantages enjoyed by every contractor with Honeywell on his team.

Call your local Honeywell office for details. There are 112 conveniently located across the nation. Or, write Honeywell, Dept. AN-4-74, Minneapolis 8, Minnesota.

Mr. Lynch at the Control Master Panel, which enables one man to check temperatures in the Roostertail's seven comfort zones. A great time-saver, especially during rush hours.

Honeywell

75th YEAR PIONEERING THE FUTURE

First in Control SINCE 1885

Rig Stays Out . . .

WELDING RIG has 150 ft. of hose. So Keller does not have to drag the rig to the basement with him. He leaves it outside and . . .

Line, Torch Go In . . .

CARRIES ONLY the torch and lines to the basement. On Sanders air conditioning installations all joints are welded and silver soldered.

Refrigerant Lines Are Run . . .

SAM RAINSON, supervising engineer, visits the job to see that all is going well. He is just in time to lend a hand with running refrigerant line across basement ceiling, through storeroom, and through crawlspace under porch.

Vacuum Pulled . . .

WITH LINES CONNECTED and drier installed, Keller hooks up vacuum pump to pull 29-in. vacuum. He checks gauges to note progress.

* * *

(Continued from preceding page)

our own. And we save the overhead costs of another license, an additional truck, and electrical tools.

"As it is, we get immediate service from our subcontractor. We have trained him for air conditioning work so that he, too, knows just what to do when on the job."

After the necessary equipment and materials are assembled and loaded on the delivery truck, they are taken to the job sit. The driver unloads the truck. With the help of the installation man, who arrives separately, he sets the condensing unit in place and puts the evaporator and other materials in the basement.

Then he leaves to make other deliveries or perform additional duties.

Left alone, the installation man goes to work. He cuts into the furnace plenum, sets the coil into place, changes blower motor and pulley if necessary, and runs refrigerant lines.

In approximately four hours, he has progressed far enough for the electrician to wire the unit and install the thermostat. At that time, the electrician arrives and does his work.

After refrigerant lines, all welded and silver soldered, are connected, the installer uses a vacuum pump to pull a 29-in. vacuum. He dries the system thoroughly.

Evacuating the system before charging eliminates about 95% of future service problems, Rainson comments.

After the system is dry, it takes an hour or so, the installer charges the system with refrigerant, checks for leaks, tapes the lines together for heat exchange effect, and starts the system running.

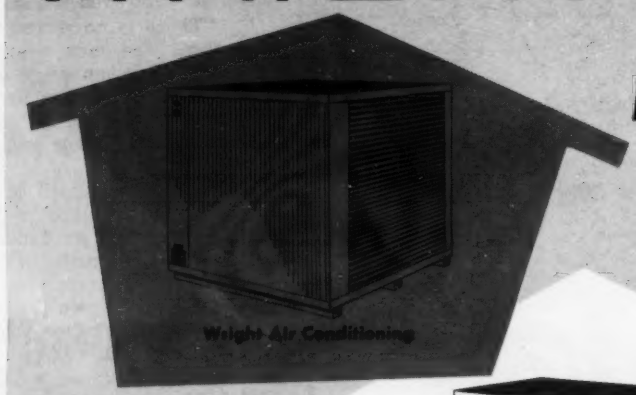
About this time, the truck driver returns to pick up leftover parts and cleans up the debris. For a job started at 9 a.m., this final clean up will occur about 4:30 p.m. Otherwise, the truck driver will return the next day to clean up.

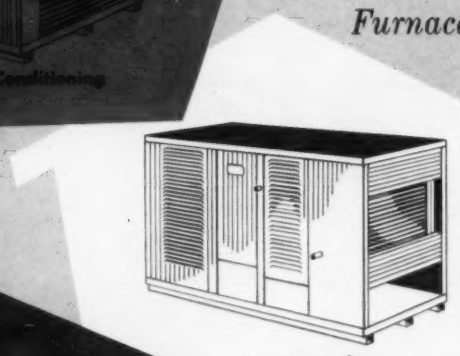
At some point during the day, Rainson visits the installation. He checks to see that everything is going smoothly, the work is being done properly, and that any unusual problems are foreseen and solved.

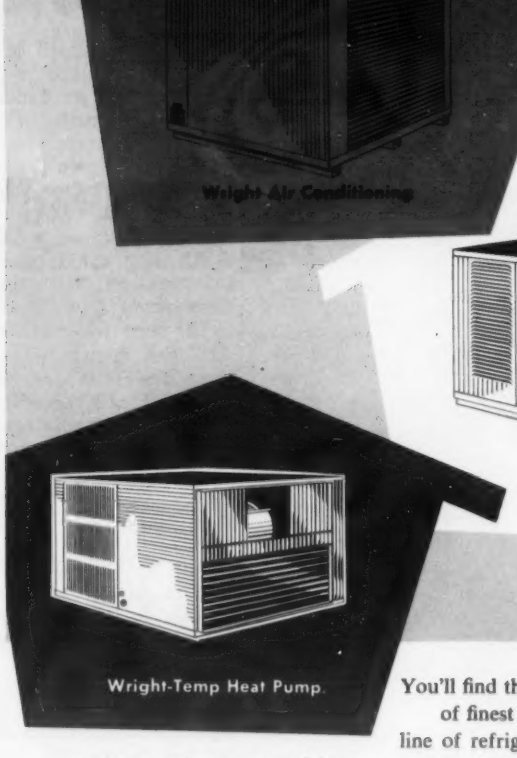
In summer the system is left running overnight to remove accumulated moisture from the house. The next day Rainson returns to make an instrument

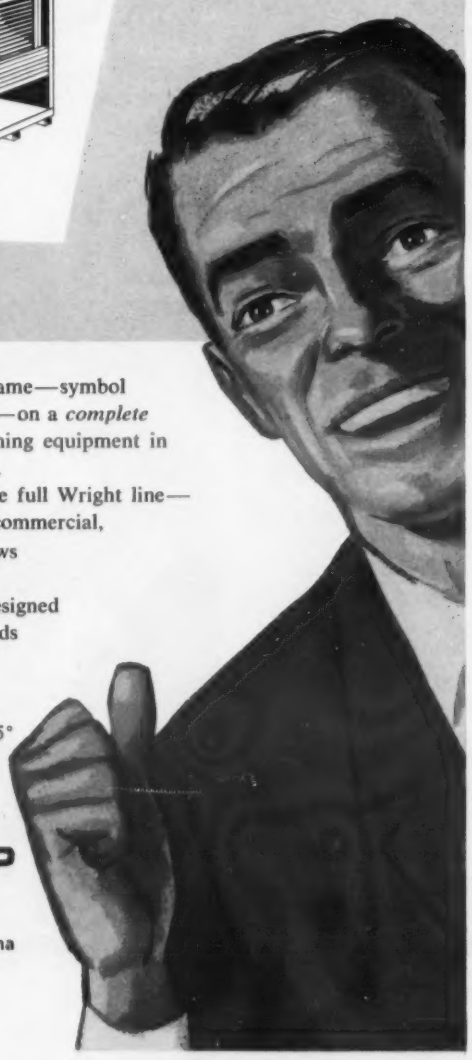
Now
WRIGHT-TEMP
offers a complete line of
AIR CONDITIONING EQUIPMENT
for every need

Wright Air Conditioning
Furnace-Cooling Combinations
and Wright-Temp
Heat Pump




Furnace-Cooling Combinations


Wright-Temp Heat Pump



You'll find the famous Wright name—symbol of finest quality in the field—on a *complete* line of refrigerated air conditioning equipment in package and remote models to meet every installation requirement.

Save time, trouble and money by recommending and selling the full Wright line—*one* dependable source of supply for every air conditioning need: commercial, residential, industrial applications; *one* supplier who knows your particular territory and problem.

Wright Air Conditioning and Wright-Temp Heat Pumps are designed and built in the Southwest especially to meet the extreme demands of the Southwestern climate. Superb Wright engineering and quality assure you of complete customer satisfaction.

All models calorimeter rated *Beyond* A R I specified conditions to 115°

For Complete Information write to

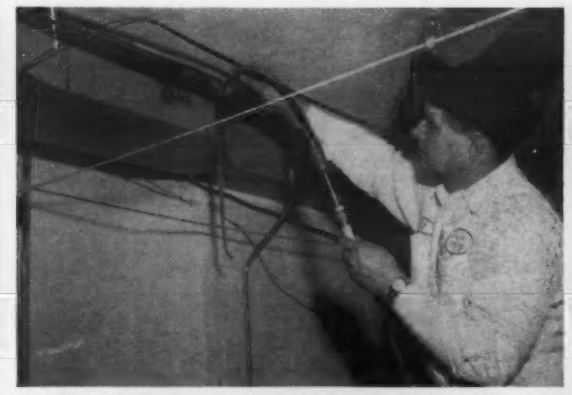
WRIGHT-TEMP
MANUFACTURING COMPANY
2902 West Thomas Road Phoenix, Arizona

"Creating New Climates for Better Living"

Charge . . . . .

AFTER SYSTEM IS DRY, Keller charges unit, watching gauges to make sure charge is correct. Installations made in cold weather, however, are not balanced out until the cooling season starts.

Test . . . . .



WITH COMPRESSOR OPERATING, Keller uses leak detector to check joints. There were only three joints on this job and one had to leak. That's the way it goes, he said.

Repair . . . . .

AFTER SHUTTING OFF liquid in condenser and blowing off gas, a few minutes with torch and silver solder and the leak is stopped. Then the charging and testing procedure is repeated.

Tape . . . . .

SYSTEM TIGHT, he wraps liquid and suction lines together with insulating tape to prevent condensation. This also helps evaporate any liquid slugs as well as subcooling the liquid refrigerant.

check of the system and balance it out.

"Checking by instrument eliminates most troubles in advance," he said. "As a result, we have very few call backs."

Instruments used regularly include a velometer, air velocity meter, amp-volt meter, Temp Scriber, leak detector, manometer, and pressure recorder.

In winter the final checking is delayed until the beginning of the cooling season.

"We'd only be kidding ourselves to call a job checked in cold weather," he added. "With low ambients, you don't get normal performance out of the condenser."

Not only does this coordinated activity produce efficient and profitable operation for the company, but it also makes a good impression on the customer, says Stein.

While the installation is made essentially by one man, the customer sees four or five men handling various phases of it. Then an engineer comes out to check over the system.

This makes her feel she is getting the attention she deserves and that the company knows its business.

"You can't satisfy a customer unless you follow through," he affirms, adding that a satisfied customer is by far Sanders' most lucrative advertisement.

First neighbors are curious, visiting the home to see what kind of a job the air conditioner is doing. Comparing it with their own hot, uncomfortable homes makes them envious. Then they become serious prospects.

Next, relatives and friends follow the same path. Finally, the customer himself often comes back for new heating or cooling equipment for his business or to modernize his home.

"Every installation sells another—at least," declares Stein.

He recalls one installation made four years ago—when Sanders first went into the residential cooling field—that has led to cumulative sales to friends and neighbors amounting to many thousands of dollars. "And there's more to come," he added.

That is why Stein is looking forward to 1960 as promising the most successful season yet for Sanders.

Customer referrals have also led to many off-season sales. During the past month, for instance, with about 5 in. of snow

(Continued on next page)

Easy as wrapping a bun around a weenie

LABOR COSTS FOR INSULATING LINES CUT IN HALF BY B.F.GOODRICH CELL-TITE INSULATION TUBING

EVEN when pipe has already been connected, B.F.Goodrich insulation tubing can be slit, snapped on and cemented in seconds. And, if you prefer, you can get it pre-slit for even faster installation. Slitting is unnecessary for new lines—it slips on straight or bent pipe as easily as a ring on your finger. Installation is so fast that labor costs for insulating pipe can be cut 50% or more over old-fashioned twine-wrapping, skirting and other slower methods.

B.F.Goodrich insulation tubing is made of a tough, flexible rubber with millions of uniform, non-connecting cells that seal out air and moisture. It can be used for insulating pipes carrying hot or cold liquids at temperatures ranging from —20°F to 200°F. Clean and easy to work with, doesn't rub off, chip or crumble. It comes in 6-foot lengths, in many wall thicknesses, that are easy to handle, easy to store.

This BFG insulation is also self-extinguishing, so it can be installed on copper tubing before sweat fittings are made—tubing is merely pushed back and held by clamps while joint is soldered.

Try this labor-saving insulation on your next job. For full information on BFG insulation tubing, call your B.F.Goodrich distributor, or contact *The B.F.Goodrich Company, 180 Derby Place, Shelton, Conn.*

INSULATION TUBING BY B.F.Goodrich

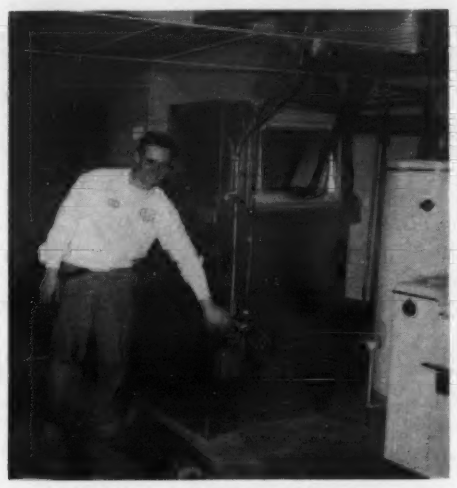
Extra Ducts . . . . .

MEANWHILE FENN snaps together duct lengths for three runs under closed-in porch. Lengths were prefabricated in Sanders' sheet metal shop. New trunk and branches are seen in last two pictures.

Are Run and . . . . .

DUCTWORK INSTALLED, Keller packs insulation around ducts as they pass from basement into crawl space. While crawl space is not insulated, closed vents create dead air space.

We're Ready to Go!



CONDENSATE LINE installed and left looped at unit and area policed, Keller snaps on unit for final check—and another day's work is done!

Sanders--

(Continued from preceding page)

on the ground almost continually, the company has averaged 1½ residential air conditioning installations per week!

"We've sold thousands of dollars worth of jobs this winter that haven't even been turned on yet," Stein observed. "This is becoming a year-round business. We've sold air conditioning in every month of the past 12."

He pointed out that Sanders can and does install any make of air conditioning equipment. However, the company prefers to stick to its regular lines: Airtemp, American - Standard, Luxaire, and Westinghouse.

"We point out to the prospect that it is to his advantage, as well as ours, to buy one of our regular brands. We tell him that our men are more familiar with this equipment, we are able to service it promptly, and we carry replacement parts in stock.

"Most of the time it is a successful argument. But if the prospect can't be convinced, we sell him what he wants."

While customer referrals are far and away the best advertising, Sanders finds newspapers the next most productive media. People interested in air conditioning will tear out a newspaper advertisement and keep it until they are ready to buy, he finds.

While Stein applauds the air conditioning manufacturers' willingness to spend money on advertising, he is of the opinion that they spend it in the wrong place.

In his considered opinion, manufacturers should divert more of their advertising dollars into cooperative newspaper advertising listing local dealers.

One final factor important in selling residential air conditioning, in volume, Stein notes, is to have a reliable source of supply.

"We have already made arrangements," Stein said, "to provide ourselves with all the air conditioners we need when we want them this year."

Sanders Heating & Air Conditioning Co. is headed by Harry Sanders, who started the business in the residential heating field in 1937. He moved into the residential air conditioning business four years ago.

Today the company does about 75% of its air conditioning business in the residential market, with the other 25% in the commercial and industrial field. Volume has been growing steadily.

All of Sanders' residential cooling business comes from homes five to 10 years old. The company does not compete for the new home market—except for heating.

About 80% of Sanders' installations go into homes in the $15,000 to $30,000 class, with the average customer owning an $18,000 home.

With prices competitive (about $750 for a remote air-cooled 2-ton job and $1,000 for a 3-ton job) and terms up to five years available, Stein believes that the residential air conditioning market is just about universal today and wide open to the firm ready to take advantage of it.

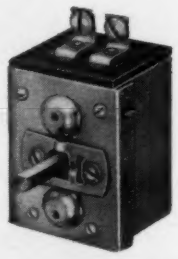
NEW WILCOLATOR SERIES G

thermostat

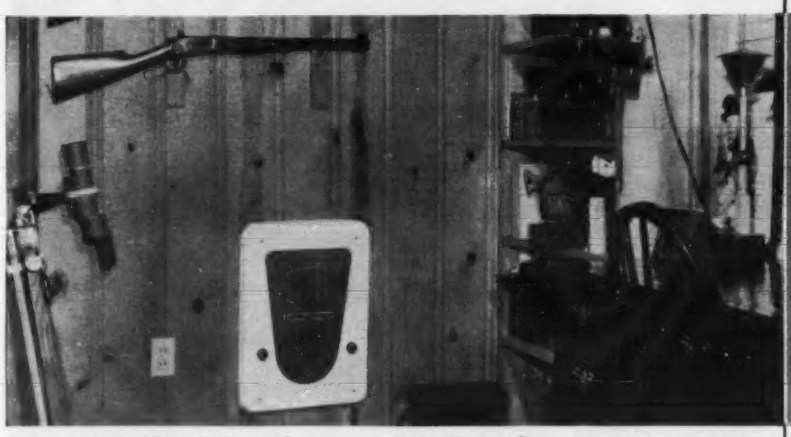
SPECIFIED FOR

Chromalox HEATER LINE

Picked for its compactness, low cost, high capacity



Wilcolator Type G1 single-pole, remote-bulb liquid expansion thermostat for electric heating applications



Photos courtesy of Edwin L. Wiegand Company, producer of famous Chromalox electric space heaters

Edwin L. Wiegand Company is one of several leading manufacturers of electric space heaters that have standardized on the new Wilcolator Type G1 thermostatic control. They find it offers significant advantages from both an engineering and cost standpoint.

For example, the improved snap-action switch mechanism of the G1 provides much higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). This permits smaller, more efficient control panel assemblies and thus helps simplify problems of flush installation.

At the same time, the G1 is generally priced lower than its bulkier counterparts—a welcome saving to the manufacturer. Equally important is its reliability—a reflection of Wilcolator's 20 years' experience in designing and producing space heater thermostats. For complete information on the G1 control, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N. J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont.

SPECIFICATIONS

Temperature range: 0°F min.; 585°F max. Special temperature ranges: to your requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to your requirement. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

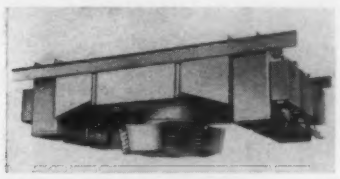
THE Wilcolator COMPANY

Thermostats for Every Heating and Cooling Application

THE WILCOLATOR COMPANY
1001 NEWARK AVE., ELIZABETH, N.J.

Subsidiaries and/or Affiliates in Canada, Great Britain, Italy, Western Germany and Australia

NEMA



Gas-Fired Duct Heater Assemblies Offered

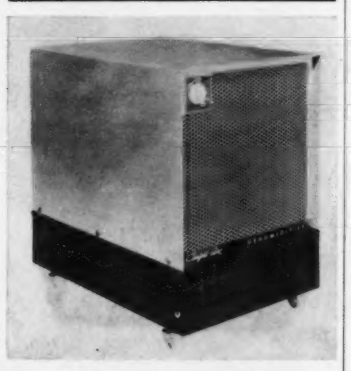
● Gas-fired duct heater assemblies for complete or supplemental heating of industrial and commercial buildings have been added to the product line of L. J. Wing Mfg. Co., Dept. AH&RN, Linden, N. J.

The assemblies consist of two, four, or six gas-fired duct heaters, a plenum chamber, a motor-driven fan, and a fixed or revolving discharge. The self-contained units need little vertical space, so that they may be mounted in the truss area of a building, and require no connections to ductwork, the company said.

The units are available in five sizes with output capacities ranging from 368,000 to 1,104,000 B.t.u.h. Four revolving and four fixed discharge designs suit installations with mounting heights up to 50 ft., and coverage of floor areas up to 132 by 132 ft. by a single unit, it was stated.

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.



Electric Dehumidifiers Designed for Homes

● Deluxe series electric dehumidifiers designed for residential basement and recreation room usage have been introduced by Heat Controller, Inc., Dept. AH&RN, 1900 Wellworth St., Jackson, Mich.

Equipped with a ⅛-hp. Tecumseh compressor, they can be used in up to 14,000-cu. ft. areas, according to the company. Water container is of styrene plastic with 8½-qt. capacity. The hose connection fits a ½-in. shower or garden hose and there are "no threaded couplings to bother with," it was stated.

The unit measures 17¾ by 12 by 17 in. and is mounted on Bassick #5479 casters. Net weight of model DH-30 is 54 lbs. and of automatic model DHA-30 56 lbs. Finish is bark brown, beige, and mahogany vinyl.

Suggested list price is $119.95 for model DH-30 and $134 with humidistat, including full five-year warranty.

Rust Protector Sprays on

● Protection against rust and corrosion of valuable metal parts is claimed for "Sprayon No. 604" by Industrial Supply Div., Sprayon Products, Inc., Dept. AHRN, 2075 East 65th St., Cleveland 3.

Oil-Fired Furnace Line Improved, Restyled

● "Outstanding" mechanical features and new styling are combined in the new "Winkler" oil-fired furnace line introduced by the Heating & Air Conditioning Div., Stewart-Warner Corp., Dept. AH&RN, Lebanon, Ind.

All new Winkler furnaces feature a 10-year guaranteed heat exchanger of heat-saving accordion design, the announcement said. The heavy steel all-welded unit is said to provide more heating surface.

Corrugated design also permits expansion and contraction without noise, and high efficiency is achieved by circulating return air completely around the heat exchanger, the firm stated. Further assuring heating economy are primary and secondary baffles, it added.

The new furnaces are available in basement, counterflow, and vertical models, capacities to 170,000 B.t.u.h. output. All are readily convertible for summer cooling immediately or any time in the future, it was pointed out.

Styling features a color combination of "Imperial Sapphire" and "Horizon Blue."

Packaged Multizone Air Conditioners Introduced

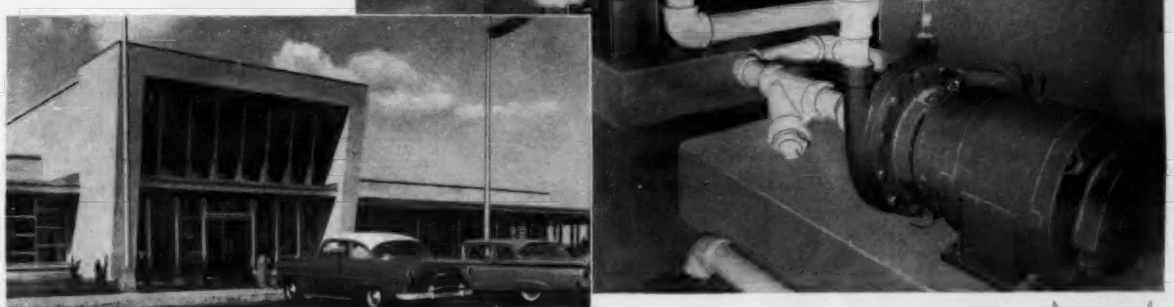
● A new line of packaged multi-zone air conditioners is now available from American-Standard Industrial Div., Dept. AH&RN, Detroit 32.

The equipment is available in nominal 25-ton, 30-ton, and 40-ton sizes. Nominal air handling capacities are 10,200, 12,600, and 17,100 c.f.m., respectively.

"In these sizes and capacities, they can provide comfort conditioning for supermarkets and other large open areas or can serve several zones or rooms or any area where excessive heat load presents a special problem," it was pointed out. "Quiet operation makes the new units well suited to the combination heating-cooling requirements of clinics, churches, and small one-story or two-story office buildings."

The new line can be purchased as either a single-zone basic unit or as a multi-zone unit. The single-zone unit is available with top horizontal or up-blast discharge. It may be equipped with a steam or hot water heating coil for off-season or winter heating. It is available in either of two arrangements.

The multi-zone unit is also available with top horizontal or up-blast discharge.



INDIANA TOLL ROAD *INTERSTATE* HOSTS *Commissary*

COOLED BY B&G® CONDENSING UNITS

Three low temperature B&G Condensing Units handle the refrigeration requirements of this well known restaurant chain unit at Elkhart, Indiana.

B&G Condensing Units offer a completely capacity-engineered combination of B&G Chassis, B&G Motor, B&G Compressor, B&G Condenser and automatic capacity control. B&G builds *all* these components into a unit specifically designed to meet the requirements of the installation.

Exceptionally rugged construction and low center of gravity assure damage-free installation. Bell & Gossett refrigeration equipment, as in all of its many products, is built to provide years of dependable service—always ready to meet the challenges of unusual conditions.

BELL & GOSSETT COMPANY

Dept. GD-47, Morton Grove, Illinois

Canadian Licensee: S. A. Armstrong, Ltd. 1400 O'Connor Drive, Toronto 16, Ontario

A COMPLETE LINE OF REFRIGERATION AND AIR CONDITIONING "PACKAGES" AND COMPONENTS

B&G Package Liquid Coolers

B&G Evaporators

B&G Centrifugal Pumps

B&G Condensers

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark reg. U.S. Pat. Office; Est. 1926

AIR CONDITIONING HEATING & REFRIGERATION NEWS

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'The Conscience of the Industry'

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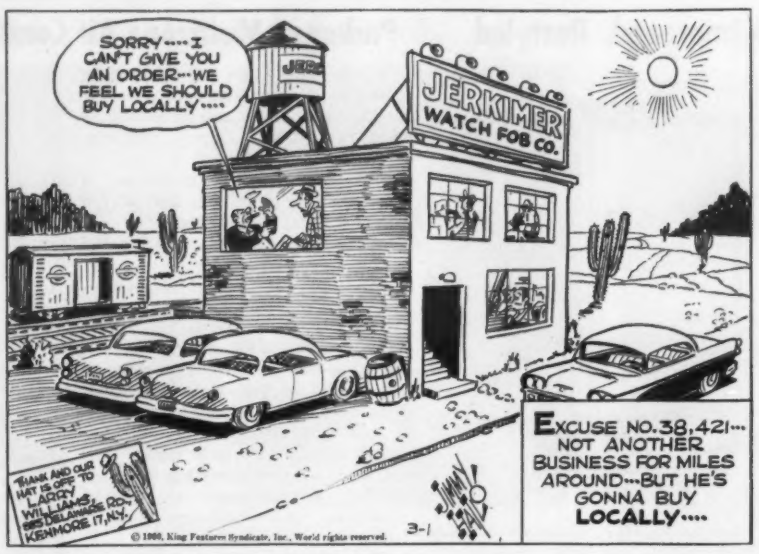
SORRY.... I CAN'T GIVE YOU AN ORDER... WE FEEL WE SHOULD BUY LOCALLY....
JERKIMER WATCH FOB CO.
EXCUSE NO. 38,421... NOT ANOTHER BUSINESS FOR MILES AROUND... BUT HE'S GONNA BUY LOCALLY....
HAT'S OFF TO LARRY WILLIAMS, KENMORE, N.Y.
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They'll Do It Every Time

by

Jimmy Hatlo

Are Heating Contractors Short-Changing Themselves and Their Customers, Too?

WHENEVER two heating men get together they soon start crying into each other's beer about the sad state of their sorry business. Specifically, low prices. Crying scene at a heating convention, along about midnight, suggests the Johnstown flood.

Prices for heating installations *have* been hammered lower and lower (no doubt about it) and the bottom may not have been reached yet.

Discouraged Dealers who attended the annual meeting of the Michigan Heating & Sheet Metal Association were astounded to learn that FHA appraisers in the Grand Rapids area have fixed upon $400 as the price of a complete heating system in a three-bedroom, ranch-type house of 1,000 to 1,200 sq. ft.

It turns out, upon investigation, that $400 *is* the going price in that area!

Time was, not so many years ago, when the heating system represented nearly 10% of the cost of a new house, and then dollars were worth substantially more than they are now. It was fairly easy for the average heating contractor to eat "high on the hog" under those circumstances.

But what did the customer get for *his* dollars? Not much!

Therein may lie a significant explanation of today's cutthroat prices in the heating field.

No less an authority than the National Warm Air Heating and Air Conditioning Association has stated that 80% of all heating systems are "lousy." This is not just a guess. Underlying facts were determined in extensive field investigation.

Did buyers (including speculative builders) eventually wake up to the possibility they weren't getting their money's worth in a heating system installation? Did this realization help drive prices down? Could be.

Average heating contractor is convinced that he should get more money for his jobs, and he further implies that for a better price he could install a better system. This belief is open to considerable question.

Even when he was getting a good price, 80% of his installations were sub-standard, NWAHACA investigations indicate.

Additional proof of this no-doubt unpopular theorem can be found in the experience of those 12 courageous and conscientious contractors in Kalamazoo who pioneered the Silver Shield program (which now is beginning to snowball, thank goodness!).

After months of preparation, culminating in an attention-getting "kick-off," many of the Kalamazoo dealers suddenly realized they didn't know all they should understand about installing a good heating system. Therefore, with most commendable intellectual honesty, they went back into a huddle for 12 weeks to learn how.

Almost invariably, when discussing the sad state of unprofitable pricing, people in the heating business refer enviously to the automobile industry, which has maintained and even increased retail prices fairly well despite a bit of rough going in the last two or three years.

Unfortunately, attention seldom is drawn to the fact that the buyer of an automobile gets much more for his dollars today than he did 20, 10, or even three years ago.

Is it bold to suggest that the consumer received considerably more for his money, relatively speaking, when he purchased a home heating system a dozen years ago than he does now?

Are heating prices too low today?

Maybe they're just about right, as far as the quality received by the consumer is concerned.

Above docile paragraph doesn't mean, however, that the situation is good, or that the NEWS condones it. Certainly, better prices should be obtained for heating and air conditioning installations. Nevertheless, higher prices can be justified only by better, *more honestly applied installations.*

Possibly the heating industry's chickens simply have come home to roost. A shotgun loaded with rocksalt is not the answer. Instead, build a better chicken coop and put a Silver Shield on it.

From the Files of the News

25 years ago . . .

A University of Illinois professor and a Detroit Edison Co. engineer reported on their separate experiments in summer cooling the home, both researchers using mechanical refrigeration for the first time. Cooling was accomplished by self-contained 2 ton units with direct expansion of "Freon" in an evaporator composed of 32 rows of finned copper tubing. Total cost of operating each system for a 3½ month period was approximately $50.

The Federal Trade Commission accused a number of dairy companies of attempting to destroy the sale and operation of counter ice cream freezers, chiefly by sponsoring legislation and city ordinances aimed to suppress competition from, sales of, and operation of the counter freezer.

Popular St. Clair Inn, St. Clair, Mich. spent $7500 to air condition forty of its rooms and reported a 50% increase in summer business a direct result of the addition. The Inn also used literature promoting the new feature and posted helpful directions in each equipped room.

Specifications of 562 models of commercial size refrigeration condensing units were published in the NEWS. General Electric predicted success for its newly introduced "foot pedal control" water cooler. York air conditioning was installed in the private offices of Mexico's governor Calles.

10 years ago . . .

New York City ordered all refrigeration systems over 3 tons capacity and air conditioning units over 3-hp shut off June 1 unless they used recirculating water systems. Dravo Corp. announced that it was awarded Pittsburgh's first large office building air conditioning job. "Much of the ductwork in the new building was designed to carry high velocity air, thus reducing the space required for ductwork."

A bill to provide licensing of refrigeration and air conditioning contractors was introduced in the New Jersey State Assembly. For violators who would continue to operate without a license, a fine of $200 was proposed. "Frigidaire proudly presents Bob Hope in his TV debut . . . on 28 stations." Minneapolis-Honeywell used a plastic man to demonstrate body reactions and sensitivity to temperature changes.

"Analysis of How Climate Influences Air Conditioning Design", an article by John Everetts, Jr., office of Charles S. Leopold, Consulting Engineer, Philadelphia, reveals how a 3-city survey shows that the cooling load chargeable to the weather is over 93% of the total load for the residence.

50 years ago . . .

From the RECOLD MUSEUM

These 50-to-60 years ago items are from the Recold Museum Library, maintained by Hy Jarvis, Recold Corp. president.

At its regular meeting the members of Texas No. 1 National Association of Practical Refrigerating Engineers organized a regular debating club as a part of their regular work. The president, E. B. Wright, names a captain for each side and they choose members on each side. Then the debate on a subject previously selected is opened. The first subject debated was "Resolved, that the Horizontal Refrigeration Machine is Preferable to the Vertical Refrigeration Machine." The second subject was "Resolved, That the Flooded Atmospheric Ammonia Condensers Are Preferable to Other Types."

Tract-priced furnace adjusts itself for heating and air conditioning

...automatically!

F·L·E·X·A·I·R·E

BY **FEDDERS**

relay-controlled multi-speed blower lets you meet exact job requirements; gives builders a big "plus" to sell

As new in concept as the FlexHermetic Air Conditioner... designed on as sound engineering principles... and aimed, price-wise and application-wise, at the same mass market for quality comfort—*that's Fedders' new FlexAire Gas Furnace.*

A multi-speed blower provides enough CFM for effective air conditioning in hot weather... then automatically adjusts air flow to meet the best warm air performance standards as soon as the control system calls for heating. And because *you* select the proper motor speeds during installation from several available combinations, you can be sure of meeting the specific requirements of each job for quiet operation and good performance all year 'round. Completely factory wired with 24-volt transformer, relays, controls.

And what a big sales "plus" you offer to merchandising-minded development builders who are always looking for good selling arguments: *Automatic year-round, whole-house comfort.* No more Spring and Fall furnace "change-overs"... and no more compromises with heating and air conditioning efficiency, with restful, quiet operation.

Available in 75,000 and 100,000 BTU input upflow furnaces for application with air conditioning systems of comparable cooling capacity. Priced to get you those big tract jobs even when bidding against ordinary furnaces... *and to leave you a good mark-up.*

plus a full line of *TROPHY* Gas and Oil-Fired Furnaces

Fedders also manufactures a complete line of modern, compact conventional gas and oil-fired furnaces. Special models for heating, models for heating-plus-air-conditioning. Gas furnaces from 75,000 to 150,000 BTU's and for 2 to 5 tons of air conditioning. Oil-fired furnaces, with enclosed oil burners, from 112,000 to 168,000 BTU's and for 2 to 5 tons of air conditioning.

FEDDERS CORPORATION · MASPETH 78, NEW YORK

A big change to a time-tested engineering concept opens up a vast new market to air conditioning

F·L·E·X·H·E·R·M·E·T·I·C

UNIFIED REMOTE CENTRAL AIR CONDITIONING SYSTEM BY FEDDERS

How can one air conditioner do all this: cut equipment costs... slash installation time... assure better performance... give years of service-free operation—yet pay a sensible profit on a much bigger sales volume to air conditioning/heating contractors?

It's easy to understand—if you're willing to do some fundamental thinking about the products you've accepted uncritically for years... about the way you've been operating since the time you first got into this business:

You will have to admit to yourself, first, that each dollar slashed out of the cost of residential air conditioning can boost the number of jobs you sell. Then, you will have to be big enough to see that this reduction in cost does not necessarily have to come out of your hide. You will have to acknowledge, finally, that modern manufacturing techniques and controls can build a tighter hermetic system... get it freer of moisture and contaminants... charge it far more accurately, in a factory than you can in the field. *And at a far lower cost.*

It could be a blow to your pride of workmanship, but it happens to be true.

FACTORY-CHARGED VS. FIELD-CHARGED

Look at this new Fedders FlexHermetic Unified Remote Air Conditioner, the Case in Point. Before it reaches you, the coils and inter-connecting tubing are cleaned with steam, water, chemical solutions. They are flushed, drained, dried, and dehydrated. *(Which of these precautions do you take in the field?)* Then, it's evacuated down to a near-perfect vacuum. *(How far down does the clean-out gauge on your charging rig go?)* It undergoes a submersion leak test at 450 lbs. PSI *(How could you do that?)* and a thorough electronic leak detection test. Finally, moisture-free Freon and high-grade refrigerant oil is fed in under controlled pressure and temperature to the exact .01 oz. required. *(How accurate is that scale you're using?)*

Convinced?

Now, let's look at the FlexHermetic from the service and standing-up-over-the-years viewpoint. Consider this fact: *Fedders has charged and sealed 2,000,000, hermetic air conditioner systems since 1948. Hundreds of thousands have been in operation for years. The service rate on leakage on these units is infinitesimal; on improper charging and contamination, even smaller.* Doesn't that compare pretty favorably with your own record? Yet none of these units have—or need—service valves, driers, receivers, sight glasses or expansion valves.

Neither does Fedders' new FlexHermetic Air Conditioner. All the costly components used in conventional remote air conditioning systems solely to assure a good field charge at the site (or to service poorly charged units), are not required for the Fedders FlexHermetic. Now you begin to see perhaps how the factory-charged, factory-sealed Fedders FlexHermetic delivers the world's finest remote air conditioning... *at the world's lowest price.*

LOWER COSTS LEAVE ROOM FOR PROFIT

Fortunately, while Fedders' FlexHermetic slashes the cost of air conditioning to a new low, public demand has boosted the sales value of air conditioning to a new high. There's plenty of room here for greater profits for alert air conditioning/heating contractors.

Over and above the lower equipment costs which the Fedders FlexHermetic makes possible, there are vast economies in installation. Just lift the flap at right to get all the facts.

Fedders is telling this low-cost, high quality story to thousands of development builders and realtors ... is enjoying a tremendous response from home builders all over the U.S. You, too, have a big role in this mass market for quality air conditioning. Mail the post card today to learn the details.

18-ft. Hermetic Li
Armored... Leak-Proo
F-l-e-x-i-b

Outdoor and indoor sections yoke
gether with 18 ft. of charged dual co
tubing that is leak-proof... vibration-p
...and completely flexible. Spiral r
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strength and rigidity. Uses standard
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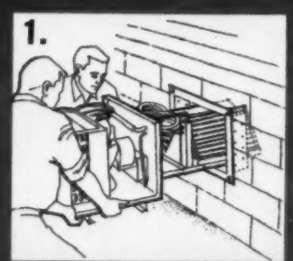
armor limits radius, preventing kinki
both lines.

a wall-mounted outdoor
pressor-condenser section...
furnace-top cooling coil.
nected together by a fl
armored hermetic line



From outdoors, Flex-Hermetic slides through steel mounting frame in wall—outdoor unit bolts into place.

2.

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-e-x-i-b-l-e

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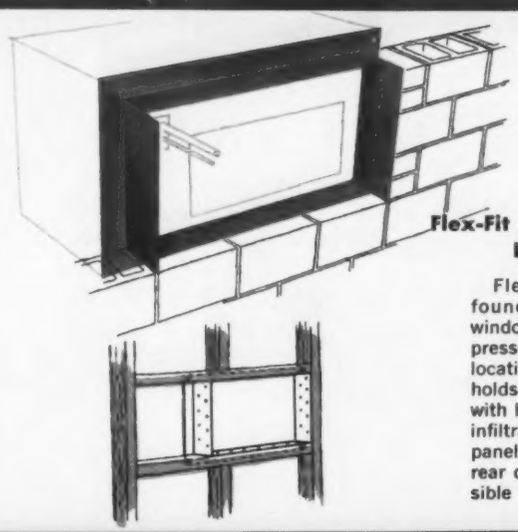
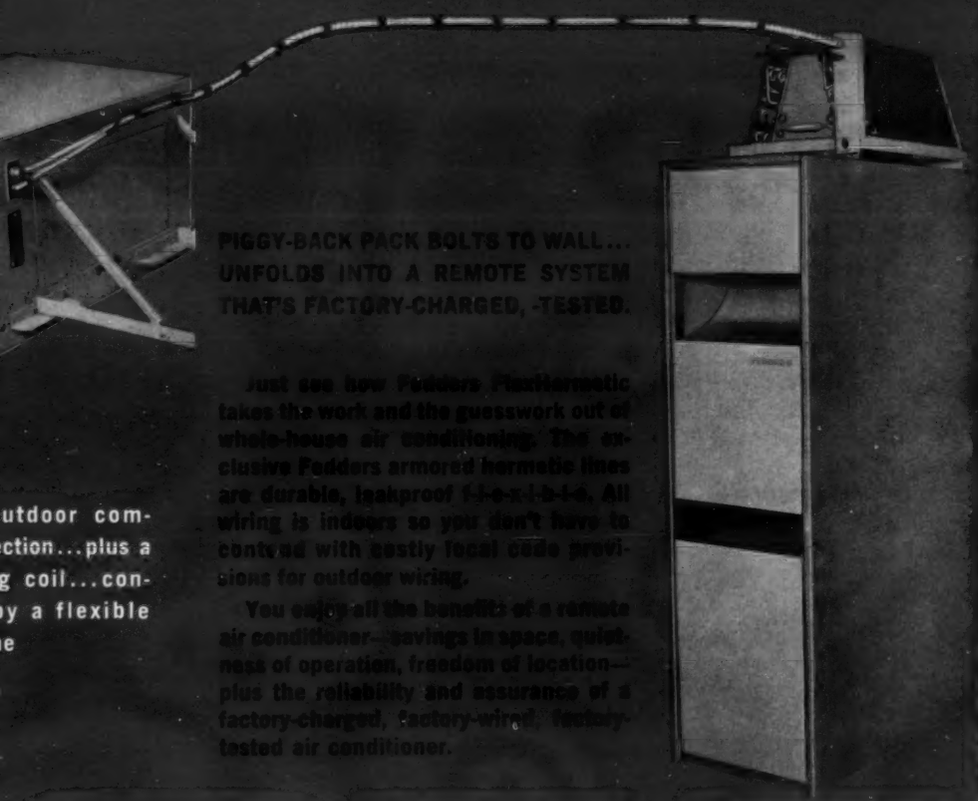


Flex-Fit Mounting System Slashes Installation Time and Cost

Flex-Fit wall frame, built into foundations or walls like regular window sash, supports outdoor compressor section in any convenient location, at any desired height. . . . holds it securely against outside wall with heavy-duty gasketing to prevent infiltration of outdoor air. Control panel and electrical junction box on rear of compressor section is accessible from indoors.

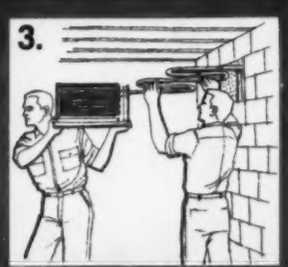


PIGGY-BACK PACK BOLTS TO WALL . . . UNFOLDS INTO A REMOTE SYSTEM THAT'S FACTORY-CHARGED, -TESTED.

Just see how Fedders FlexHermetic takes the work and the guesswork out of whole-house air conditioning. The exclusive Fedders armored hermetic lines are durable, leakproof 1-l-e-x-i-b-l-e. All wiring is indoors so you don't have to contend with costly local code provisions for outdoor wiring.

You enjoy all the benefits of a remote air conditioner—savings in space, quietness of operation, freedom of location—plus the reliability and assurance of a factory-charged, factory-wired, factory-tested air conditioner.

2. From indoors, workmen remove shipping braces to unyoke cooling coil.



3. Armored hermetic line unfolds easily without kinking. 15-feet long.

4. Horizontal section cooling coil to furnace and pieces it in position. Installation complete!

HERE'S HOW REVOLUTIONARY

F·L·E·X·H·E·R·M·E·T·I·C

AIR CONDITIONER

GIVES THE LOWEST INSTALLED COST

NO FOUNDATION SLAB

to excavate and grade. No forms to set or pour. Flex-Fit wall frame sites the outdoor section in any location, at any height where installation is fastest.

NO OUTDOOR WIRING

to fuss with. No conduits or weather-proof cables . . . no outdoor disconnect switches . . . no difficult local electrical codes to cut your profits.

NO HERMETIC LINES

to lay out . . . buy . . . bend . . . solder. FlexHermetic armored lines are far sturdier, kink-proof and leak-proof. Best of all they are factory-warranted.

SERVICED FROM INDOORS

so maintenance chores can be performed faster with everything at hand in one convenient location. Precision controls require less maintenance.

NO PURGING, CHARGING

of remote units. No valves . . . no gauges . . . no freon tanks . . . no scales. Factory-charged and factory-tested—so you know it's right.

BENEFITS FOR CUSTOMERS

FlexHermetic assures lowest operating costs by eliminating any possibility of undercharging or leaks.

tear out . . . fill out . . . mail today for full information

Gentlemen:

Please send me full information about the FlexHermetic Air Conditioner. ☐ Also about Fedders FlexAire Furnaces. ☐ I want to see a local sales representative. ☐

NAME_____
(Please Print)

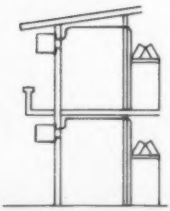
FIRM_____

ADDRESS_____
(Street)

_____
(City) (State)

Above grade through foundation to basement furnace

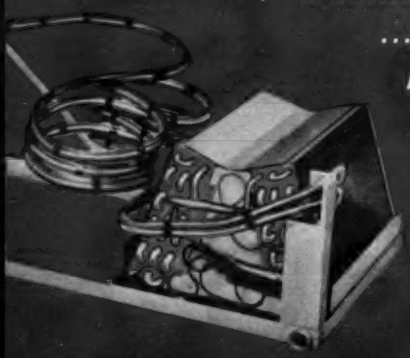
Under eaves through studding to utility room furnace in slab home



Through brick wall to furnace in interior closet in garden apartment

On concrete slab through studding to basement furnace in older homes

ONE COMPACT, EASY-TO-HANDLE PACKAGE — FACTORY-SEALED ...CHARGED...PRE-WIRED ALL READY TO INSTALL



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OFF THE CHEST

Reaction to Humidifier Series . . .

LEAVES NOTHING TO BE DESIRED

Friez Instrument Div.
Bendix Aviation Corp.
Baltimore

Editor:

I would like to take this opportunity to congratulate you on your excellent series concerning forced humidifiers. Your coverage of the subject leaves absolutely nothing to be desired. We have a definite personal interest in this application as Bendix Friez has been working with the forced humidifier manufacturers for the past ten years trying to help them solve their control problems. We wholeheartedly agree with your statement that the humidifier market is finally coming into its own and the growth shown in the past few years has been quite remarkable.

Congratulations again on a wonderful series and if there is any way we can be of service, please feel free in contacting us.

EDWIN A. NELSON

HOPES WE ARE PLANNING TO REPRINT SERIES

Research Products Corp.
Madison, Wis.

Editor:

I read the first installment of your article on "Forced Humidifiers" and wanted to congratulate you on a nice job. I hope you are planning on making reprints available, since we will probably want 500 to 1,000.

You mentioned in a letter to Al Brown, our Vice President for marketing that you will be discussing later in the series, the problem of sizing humidifiers. Do you intend to have a list somewhere in your article of various pieces of literature that are available upon request. I mention this, since we have a pamphlet which covers that, our Industrial Humidification Guide, which we will be glad to send out on request.

DALE O. BENDER,
Chief Sales Engineer

VERY THOROUGH, INFORMATIVE

Walton Laboratories
1186 Grove St.
Irvington 11, N. J.

Editor:

More congratulations are due you for the very thorough and informative series of articles on "Forced Humidifiers."

From our standpoint the only error that we could detect (and don't say we didn't try) appeared under the photograph of our model WF humidifier at the end of the series.

The photograph showed our standard model WF which is designed and recommended only for return air ducts. The blower of the average furnace is responsible for positive static pressure and considerable air turbulence within the discharge air plenum. Our experience has proven this to be a relatively poor location for a positive type humidifier. We therefore have five years and more experience using humidifiers on a straight run of return air duct.

When location is selected to avoid nearby elbows, dampers, filters or similar obstruction, vapor disappears into the return air and reappears as humidity in the occupied space. Installation assures uniform supply to each branch duct. This cannot be readily controlled from supply plenum.

J. R. LEWIS,
Vice President

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

PURLEY RETURNS WITH BRIEF CASE FULL OF ORDERS

Lec Refrigeration Ltd.
London, England

Editor:

Just back from Canada and the U.S.A. with a brief case full of orders for refrigerators is Mr. C. Purley, Chairman and Joint Managing Director of Lec Refrigeration Limited, Bognor Regis.

During his whirlwind 33 days Mr. Purley visited various manufacturers to study new methods and developments, attended a convention, and called on the company now building Lec compressors under licence in Canada.

Perhaps the most important result of his mission is in his order book. Nearly $250,000 worth of refrigerators to be delivered to major centres of the United States and Canada over the next three months.

For the first time Lec refrigerators, which have been selling in large numbers for some years in Canada, will corner a section of the U. S. market, where they will be used in flats, yachts, offices, motels, bars and trailers.

(Mrs.) VALERIE NOON,
Publicity Officer

TAKES EXCEPTION TO HEATING EDITORIAL

Peerless of America
Chicago, Ill.

Editor:

In your issue of Feb. 1 you come out with a strong editorial on what is required in heating.

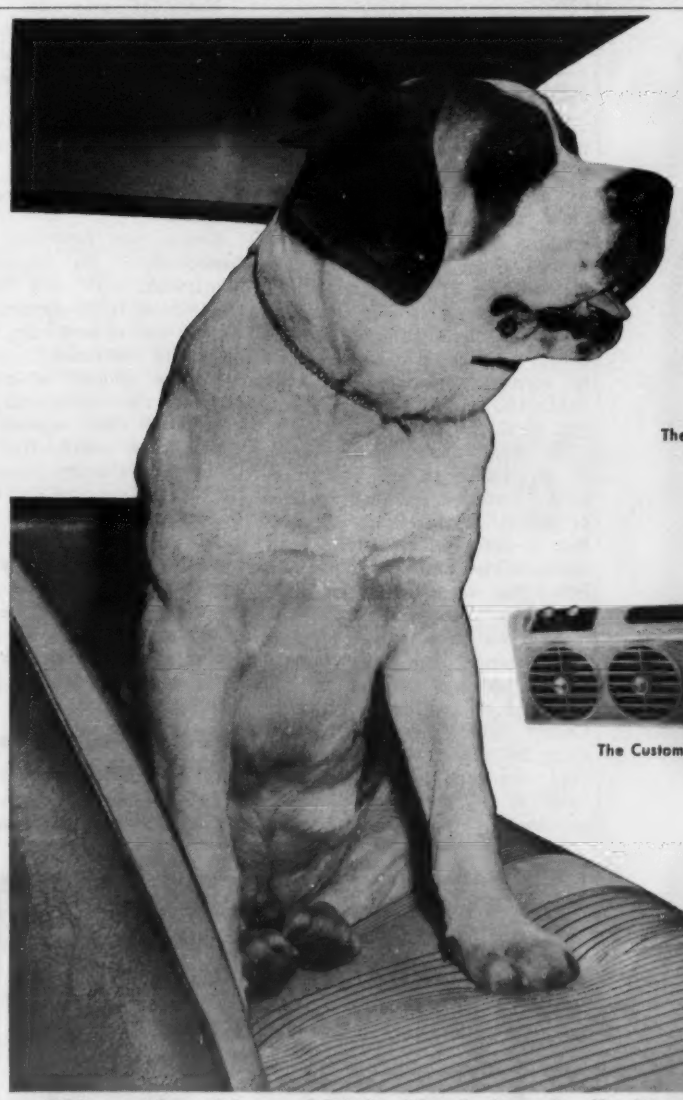
Warm floors are very desirable in a heating system, but you will never secure them without some means of removing the cool air from the floor. The editorial makes another statement that for economy's sake there should be no superheated air at the ceiling.

Elimination of a blanket of superheated air at the ceiling is impossible without installing a wind tunnel in each room. Again, you cannot secure a draftless condition when you do this.

It also brings up the point of avoiding too long an interval between burner operations. This is possible if a Christmas tree of controls is added to any heating system, but until someone comes up with a burner that never turns off but modulates only in accordance with outside temperature, it is difficult to secure a short interval between burner operations.

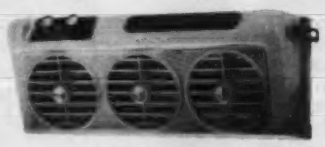
I am sending herewith some of our latest engineering information on heating and air conditioning. It may give you a different concept of the problem.

R. W. KRITZER.
President

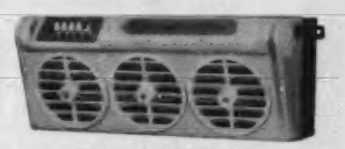


"Dog-goned GOOD Auto Air Conditioners!"

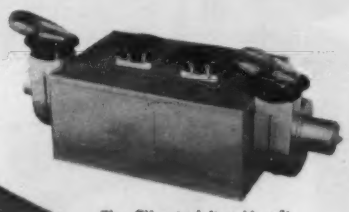
The Imperial unit



The Custom unit



The Hot & Cold unit



The Climatrol (trunk) unit

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15 Ways To Lower Maintenance, Operating Costs by Pre-Planning Commercial System

NEW YORK CITY — When planning the installation of air conditioning and heating equipment — or other mechanical equipment—in commercial buildings, thought should be given to future servicing and operating of the equipment.

W. J. Benesch, chief engineer of Syska & Hennessey, Inc., consulting engineering firm here, points out that the failure to do so often means unnecessarily increased maintenance and operating costs for the building owner.

Benesch enumerated 15 ways in which good pre-planning can help to reduce these maintenance and operating costs. (See accompanying table.)

They boil down to the need for the engineer designing the job to:

Allocate sufficient mechanical space.

Make machinery and controls accessible.

Select materials from standpoint of operating and maintenance economy as well as low initial cost.

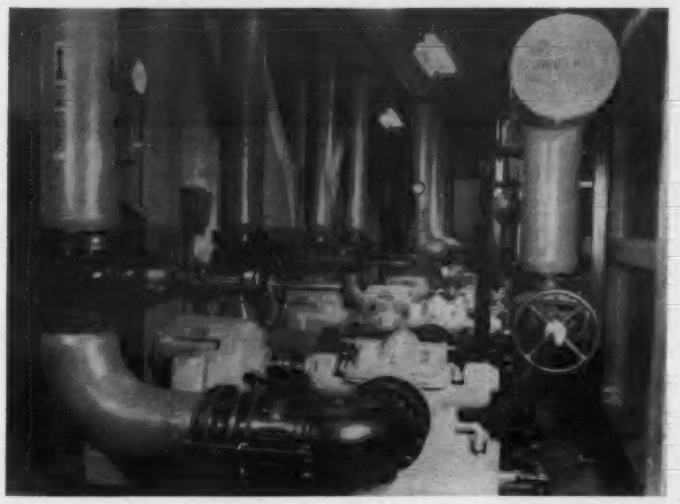
Evaluate automatic operation.

Provide detailed inspection during construction.

Good planning and adequate space allocation in early design stages will save hundreds of man-hours in subsequent operating and maintenance costs—and will offset any loss of rentable income that the extra space precludes.

The penalties paid in time, money, and inadequate servicing because of space limitations have been bad in the past, Benesch said. But with the increase in the amount of complex mechanical equipment in today's buildings, the situation is bound to worsen unless plans are made in advance to avoid it.

A relatively simple maintenance or repair job can be made complicated by lack of space. An inaccessible piece of equipment that needs repair or replacement can sometimes be reached only by dismantling some other equipment in front of it, again causing disruption of services and tenant discomfort.



THESE CONDENSER water pumps are interconnected so they can be operated individually or in any combination. Check valves are provided for individual pump operation as required.

Cooling Coils Could Not Be Removed Without Dismantling Other Units

A case in point: Because of limited space conditions, several dehumidifiers were located side by side. They were placed so close to one another that the cooling coils could not be removed from one without first dismantling the other units. Consider the waste of time and money in dismantling three units every time cooling coils had to be repaired on one. Silly, but that's the result of space squeezing, Benesch said.

In other instances one piece of equipment must be placed above another because of lack of space. Maintenance personnel, in order to reach the high, inaccessible unit, will use the lower one as a temporary platform and damage it.

At other times a disinterested maintenance man may neglect out-of-the-way equipment instead of struggling to reach it. Costly breakdowns and equipment failures result. Typical of this situation is the awkward location of thermometers and automatic temperature-control equipment which, by their nature, must be located near the equipment they control.

Even if adequate physical space is allotted for machinery and equipment, the general area must be accessible. If equipment is located in a security area, for instance, maintenance men must wait for doors to be unlocked. They are then supervised in their work and costs again begin to mount.

Costs for contract maintenance work on filters, water treatment, etc., are based on free access to equipment. When time is lost in servicing, the rate naturally increases.

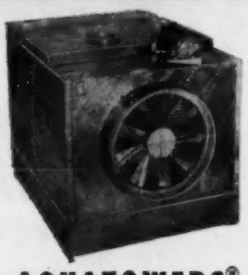
Valves should be placed in strategic locations and in such a manner that repairs can be made to a small area of the building without necessitating the shutdown of the entire building.

Air diffusers which require maintenance should be so designed and located that they can be cleaned and serviced with minimum effort. Some units installed in buildings today require a major project for such a simple job.

Allow Sufficient Space For Moving Equipment

Often heavy equipment must be moved for maintenance or

it's MARLEY for



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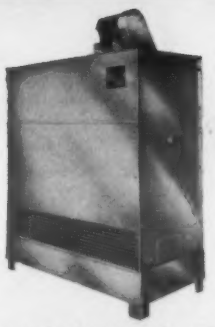
World's best-known steel mechanical draft cooling towers. Heavy-duty mechanical equipment, close-packed filling cube, exclusive diffusion deck and hot dip galvanized finish result in unequalled performance, economy and durability. 14 models from 3 tons up; dual units extend capacities to 120 tons nominal.



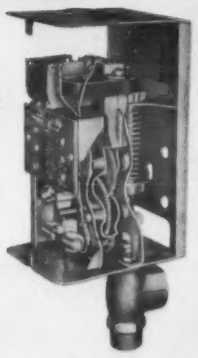
AQUACOOLERS®

Indoors or out, in minimum plan area, AquaCoolers can be easily and economically installed. Performance is full-capacity; operation is whisper-quiet and leakproof. Heavy gauge steel casings and basins, as well as centrifugal blowers and scrolls, are hot dip galvanized for extra service life. 10 models available, 5 to 90 tons, nominal.

OTHER MARLEY PRODUCTS:
SPRATOWERS® . . . for natural draft cooling
WOOD AQUATOWERS® and PERMATOWERS® . . . for longest life in corrosive atmospheres
DRICOOLERS® . . . air cooled refrigerant condensers

ENGINEERED BY EDWARDS

Low Cost, Motorized Zone Control Valve Is Completely Silent, Has Long Life



• Positive-shut-off • Completely enclosed, hermetically sealed silent mercury switches • Powerful electric motor — 24 or 115 volts • Perfect for hot water or steam systems, ¾" to 3" sizes • No thermal leakage, trouble-free, guaranteed

FREE....70 page design handbook on single and multi-zone hot water baseboard heating systems.

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For free booklet on how to solve water problems, write:

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HAGAN BUILDING, PITTSBURGH 30, PA.

DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.

Suggestions for Lower Maintenance and Operating Costs

1. Locate frequently-operated valves for ease of access and operation.
2. Locate floor drains in such a way that piping need not be run over the floor, creating unsightliness and tripping hazard.
3. Provide for orifices in main steam lines, condenser mains, and chilled water mains at time of installation; later orifice plates can be installed after proper capacities have been determined through actual operation.
4. Don't stint on the number and size of access doors. Size them generously for adequate future maintenance and cleaning of filters, coils, and bearings. Call for access doors in fan scroll casings to insure proper cleaning of fan interiors; also in ductwork to permit periodic cleaning of interiors.
5. Interconnect as much equipment as possible where economically practical, to provide maximum flexibility for possible contingencies.
6. Provide sufficient space in fan rooms for proper duct design, thus eliminating need for inefficient abrupt bends at fan discharge and intakes.
7. Specify waterproofing of floors for all areas where water is used, such as spray pans and pumps; particularly where equipment floors are above tenant-occupied spaces.
8. Provide ample lighting near machinery, and particularly in corners of fan rooms.
9. Allow ample space near and above heavy exchangers, pumps, etc., to permit installation of proper rigging for removal.
10. Locate steam stations and steam meter rooms away from air conditioned areas. When conditions will not permit such design, provide suitable insulation and special supply ventilation to carry off heat before it affects adjacent areas.
11. Consider comfort of operators in boiler rooms, compressor rooms, and other areas where heat-producing equipment is located.
12. Locate apparatus and machine rooms a sufficient distance from occupied areas to prevent vibration and noise from penetrating to them. When this is impossible, include necessary corrective sound and vibration isolation.
13. Control all piping layouts during installation to guarantee no future interference with access door openings or equipment that must be serviced.
14. Provide ample protection in heavy traffic areas for insulation on piping, ductwork, and fan enclosures, often damaged by periodic maintenance.
15. Make sure that there are sufficient flanges and unions in piping of heavy apparatus, pumps, and other new equipment so that as little piping as possible will be disturbed and a minimum of dismantling encountered for small repair jobs. This precaution is best controlled during construction.

SHOWN here are two access doors. Door on right leads to electrostatic precipitator, is used during cleaning, inspection, maintenance. Door at left is to inlet of fan scroll. Note clean approach to both doors, uncluttered by piping, ductwork, wiring, machinery, permitting ease of access. At the bottom of photo, on floor, between access doors, is a convenient floor drain.

replacement and improper space planning has resulted in injury to personnel and nearby equipment.

Sufficient space should be allocated above condenser heads, transformers, switchgear, motors, and other heavy equipment, and proper hooks and hoisting devices provided for safe removal of units and components.

One of the factors contributing to high maintenance costs is the tendency to sometimes sacrifice quality in order to reflect an initial low figure and thus stay within a budget, which itself is often set too low at the outset. This can only result ultimately in continued high maintenance and replacement costs, since false economies and calculated risks are undertaken.

One of the calculated risks that engineers, owners, and architects are tempted to try is the reduction of the number of zones for perimeter type air conditioning. Occasionally, where original designs call for independent zoning on each exposure, one system is used instead, under the guise of economy and space saving.

The result is almost always dissatisfied occupancy, followed by the almost impossible task for management to rectify and correct the condition. Final result is modification of the system by various means. Whatever the solution, it's bound to be costly—and in most cases is not altogether satisfactory.

Automatic Operation Cuts Labor Costs

In the more complex modern buildings of today, lowering of operating costs and conservation of manpower can be obtained through automatic operation of mechanical and electrical equipment. Clocks, electric eyes, "supervisory systems," and other automatic devices can operate and control equipment dependably and accurately.

Many arguments have been presented for and against this type of "automation," but current active installations, with automatic controls and proper operating procedures, are functioning satisfactorily and efficiently—proving that it can be done.

A well-thought-out and well designed mechanical system is only as good as the contractor's fabrication and installation. Many operating problems are traceable to faulty installation and are not discovered until long after the contractor has left the job.

Thus, inspection by the consulting engineering firm that has evolved the design is of prime importance during the construction phase, Benesch believes.

Corrective work and replacement costs are time consuming and expensive. Clogged strainers, loose or jammed dampers, obstructions in ducts, unbalanced air distribution are just a few of the possible conditions that might well have been eliminated by a thorough program of inspection and supervision during the entire construction period.

New Post

York Elects Haines As Vice President, Asst. to President

YORK, Pa.—Creation of a new position of vice president and assistant to the president and the election of Edward M. Haines to fill the position have been announced by the York Div. of Borg-Warner Corp.

E. M. Haines

York President Henry M. Haase said Haines brings to his new job a broad experience in administration, operations, and sales in both the industrial and appliance fields.

The new vice president has served as consultant to the vice president for marketing with the General Electric Co. in New York City. Prior to that he was general manager of the Hotpoint Div.'s Kitchen Appliance Dept. in Chicago; general manager of Hotpoint's Dishwasher, Water Heater & Custom Appliance Department; manager of the G-E Kitchen Units and Builder Sales Dept.; and marketing manager of the G-E Home Laundry Dept.

Haines spent a number of years as vice president, sales, in the contract machine building, metal stamping, and test equipment fields.

New **ANEMOTHERM AIR METER** *gives you*

Air Velocity
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Static Pressure

with

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The new model 60 Anemotherm Air Meter helps you balance heating, ventilating and air conditioning systems the modern pushbutton way. It puts air velocity, air temperature and static pressure at your fingertips ... pays for itself through time saved on only one major job. • **Write for Bulletin 55 giving all essential data.**

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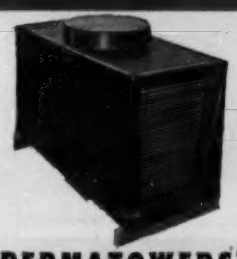

PERMATOWERS®

Permatowers offer permanent performance in *any* climate, due to liberal use of inert materials. They also afford a wide latitude in location because air discharge is vertical . . . operation is remarkably quiet . . . and they are virtually immune to corrosion. Performance and simplicity result from famous Double-Flow® design. 11 models in capacities ranging from 5-75 tons, nominal.

WOOD AQUATOWERS®

Forced draft design with vertical air discharge permits installation in confined areas often unsuitable for other towers. Longer service life under the most rigid operating conditions is assured by framework of lifelong redwood, asbestos cement board casing, and hot dip galvanized steel components. 5 models available with nominal capacity of 20-50 tons.

OTHER MARLEY PRODUCTS:
SPRATOWERS® . . . for natural draft cooling
STEEL AQUATOWERS® . . . for mechanical draft cooling
AQUACOOLERS® . . . for service indoors or out
DRICOOLERS® . . . air cooled refrigerant condensers

Ductwork with Interior Insulation Is Feature of New Bldg. In Washington, D. C.

Fiberglas Liner Applied Prior to Fabrication

CHEVY CHASE, Md.—What is described as one of the most extensive applications of duct insulation in construction of a major building was completed recently here.

Ducts of the heating and air conditioning systems of the Government Employees Insurance Co.'s New Operations Office Building now under construction in Chevy Chase, near Washington, D. C., were completely insulated.

A total of 155,000 sq. ft. of "Fiberglas" mat-faced duct liner, more than enough to cover three regulation football fields, was applied to the interior of the ducts for acoustical and thermal purposes.

Because the duct liner was applied to interiors of the ducts, savings were realized in installation costs and the need for a vapor barrier was eliminated, according to Owens-Corning Fiberglas Corp.

"The resilient Fiberglas product was applied flat to the metal which later was formed in a sheet metal brake without damage to the insulation," it was stated. "Ofen, the insulation is applied after the ducts are formed."

A. Ernest D'Ambly of Philadelphia, the mechanical and electrical engineer for construction of the building, said this method of insulating air ducts has become standard on large projects handled by the firm.

Installation of external insulation on ducts in the shafts would have been impossible because of space limitations, the company said.

Most of the noise of the moving air is absorbed by the duct liner resulting in a "whisper quiet" system, according to Joseph J. Mathy, of the Mathy Sheet Metal Co. of Washington, the firm that installed the metal duct and insulation.

Two 575-ton Carrier centrifugal compressors supply 2,900 g.p.m. of 45° F. water to 15 spray coil air units. The air units supply 370,000 c.f.m. of 55° F. constant temperature air.

"Some 100,000 sq. ft. of the liner was 1-in. thick and the remainder was ½-in. thick," Owens-Corning said. "The low thermal conductivity of the duct liner assures high insulating efficiency as its "k" value averages .24 at 75° F.

"Fiberglas mat-faced duct liner has a very low air friction coefficient of .017 to .020 when adhered inside a finished duct. This low friction surface is made possible by a smooth glass mat face that is firmly bonded to the insulation by a special process, making the surface an integral unit with the insulation."

The GEIC building houses 1,100 persons in 276,000 sq. ft. of floor space—almost one and one-half times the total area of the company's two downtown Washington buildings. Were the same amount of floor space built on the 14th and L Sts. property of GEICO, the resulting structure would rise 35 stories.

Vincent G. Kling of Philadelphia was architect for the buildings; McCormick - Taylor Associates, also of Philadelphia, was structural engineer; Turner Construction was the general contractor; and Ebasco, Inc., New York City, space consultant.

Travelers Insurance To Cool 4 Buildings

HARTFORD, Conn. — Plans for air conditioning its four buildings at a cost of $5,800,000 were announced recently by Travelers Insurance Cos.

The project will start in May and will take two years, according to J. Doyle De Witt, president. He said more than one million square feet of office space is involved.

De Witt added: "We believe this is one of the largest air conditioning renovation jobs undertaken in New England."

Toledo's Tallest To Be Cool for '61

TOLEDO—Occupants of the Owens-Illinois Bldg., Toledo's tallest building, will have to sweat it out this summer, but come the summer of 1961, they'll have air conditioning.

Complete air conditioning is included in a major modernization program for the building. Construction has started on the system, which will be completed in time to heat the building next fall.

The system, which filters, dehumidifies, and circulates fresh air, in addtion to heating and cooling, is being installed by the R. L. Spitzley Heating Co., Detroit.

New York Contractor Wins Contract for San Juan Hotel Job

NEW YORK CITY—Bertran-Walker Corp., Santurce, P. R., a subsidiary of A. D. Walker & Co., Inc., New York mechanical contractor, has been awarded a $400,000 contract for the installation of an air conditioning system and all plumbing in the El Miramar Charterhouse hotel, San Juan, P. R., it was announced here.

The hotel, owned by the Miramar Hotel Corp., headed by J. J. Otero, will be the first of the Charterhouse chain of motor hotels outside continental U. S. On its completion late in 1960, the nine-story, 216-room, $4,500,000 hotel will be operated by the Hotel Corp. of America.

Angel Aviles is the structure's architect. Curtis & Davis Associated Architects and Engineers are representing the Hotel Corp of America. J. J. Otero Development Corp. is the prime contractor.

A short series on metering devices—capillary tubes, expansion valves—will follow completion of the articles on Applied Electrical Theory.

COMPACT — EASY TO SELL AND INSTALL

LARKIN

AIR CONDITIONING COMPONENTS

2, 3, 4 and 5-ton Capacities†

It's time to turn the sizzling home air-conditioning market into a piece of cool profit for yourself. One way to make that profit, and hold on to it, is to build custom systems with dependable LARKIN Air Conditioning Components.

Whether converting existing hot air systems, adding cooling to homes with wet heat, or installing year-round systems in new homes—it will pay you to use quality LARKIN products, priced to give you a competition advantage.

A HOST OF STRONG FEATURES

- Available in 2, 3, 4 and 5-ton capacities†
- Equipped with Larkin cross-fin coil, staggered copper tubing with aluminum fins UL approved
- Evaporator equipped with pressure-type distributor and external equalizer connection
- Insulated drain pan to prevent sweating
- Pre-punched holes for easy installation
- Cases of the DAH and DAC are fully insulated and finished in gray enamel
- The DAH is equipped with centrifugal fan, permanently lubricated motor and throw-away filters

BASIC RATINGS

Model	Capacity Btu/hr*	Cfm	Model	Capacity Btu/hr*	Cfm	Model	Capacity Btu/hr*	Cfm 0" SP
FP-2	25,600	800	DAC-2	25,100	800	DAH-2	24,800	950
FP-3	35,900	1200	DAC-3	37,300	1200	DAH-3	39,400	1375
FP-4	48,100	1600	DAC-4	48,960	1600	DAH-5	64,800	2180
FP-5	61,300	2000	DAC-5	61,200	2000			

†DAH is not available in 4-ton size
*Capacity based on 80° DB 67° WB entering air, 40° F suction temperature, R-12 or R-22 refrigerant.

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ATLANTA 1, GEORGIA

School Air Conditioning Grows as Public Realizes How Benefits Outweigh Costs

HARRISON, N. J.—Declaring that an "astonishing number of educational facilities throughout the country are being air conditioned or built with future air conditioning in mind," A. J. Hackl, general manager of Worthington Corp.'s Air Conditioning Div., reported that the company recently secured an order for 4,000 tons of air conditioning for the University of Texas.

"We have had systems operating successfully in other southern universities such as Tulane, Rice, and Southern Methodist for several years," he pointed out.

"It isn't restricted to just the South by any means. There are numerous northern institutions using our equipment also.

"Our Tulsa, Okla. dealer recently completed an installation at Enid Junior Hight School in Enid, Okla. He stated that the increased learning capacity, the health benefits, and the flexibility of possibly using the school 12 months of the year were the reasons behind the decision to buy air conditioning."

Hackl said the three-month "lay-off" during the summer is considered by many to be old-fashioned. With the rising costs of school activities, one of the best ways to combat this problem is to build schools that can function 12 months a year, it was stated.

According to Hackl, many feel that the summer lay-off results from a combination of two outdated philosophies: (1) Custom—relating back to the days when our habits and living standards required summer vacations; and (2) climate conditions—it was believed that it was impossible for children to concentrate on their studies during hot weather.

"But," it was stressed, "in the 20th Century the average children aren't required to help us 'work the farm' or 'do the chores' and the climate problem has been answered with the acceptance of air conditioning."

Seattle Heat Pump Installation Posed Many Mechanical Problems

SEATTLE—A year-round air conditioning installation to which Advanced Utilities Corp. here points with pride is at the Washington Education Association building where the firm installed twelve 3-horsepower heat pumps.

Commenting on the installation, Jim Evans of Advanced Utilities said there were many problems to face. The main ones, he said, were that the building had hot water heating and many pipes interfering with the ductwork for the heat pump air conditioning.

Stating that his firm "also had doubt and confusion to battle," Evans added: "However, the job was completed and is working very nicely." The heat pumps that were selected are manufactured by Fedders.

"We installed six 3-hp. pumps on the roof of the building, each pump operating an individual duct system," Evans pointed out, "and six 3-hp. pumps stacked and tied together into central delivery and return air plenums located in the basement.

"We removed the electric resistance heat and use their hot water system as supplementary heating. We cut in the hot water heat at an outside temperature controlled by an outside thermostat. This method makes the heat pumps the main source of heat.

"The hot water system is completely turned off the first of March and not turned on again until Nov. 1. There will be a nice savings over their hot water heating costs, this source being a commercial steam plant."

Evans reported that there were also problems in the wiring.

"In order to cut down on the amperage for starting the pumps, we had to develop our own timing device to lag the starting of each pump behind the other. This resulted in less wiring costs."

2 Fort Jackson Medical Buildings To Be Cooled

COLUMBIA, S. C.—Guimarion & Doan, Inc. here has been awarded a $9,679 contract for air conditioning two buildings at Fort Jackson.

The buildings are going to be used as a medical examination station, according to the announcement.

U. of C. Offers 5 Refrigeration Courses In San Francisco

BERKELEY, Calif.—Five refrigerating, air conditioning, and heating courses will be offered during the spring semester by University of California extension in San Francisco and Berkeley at evening classes.

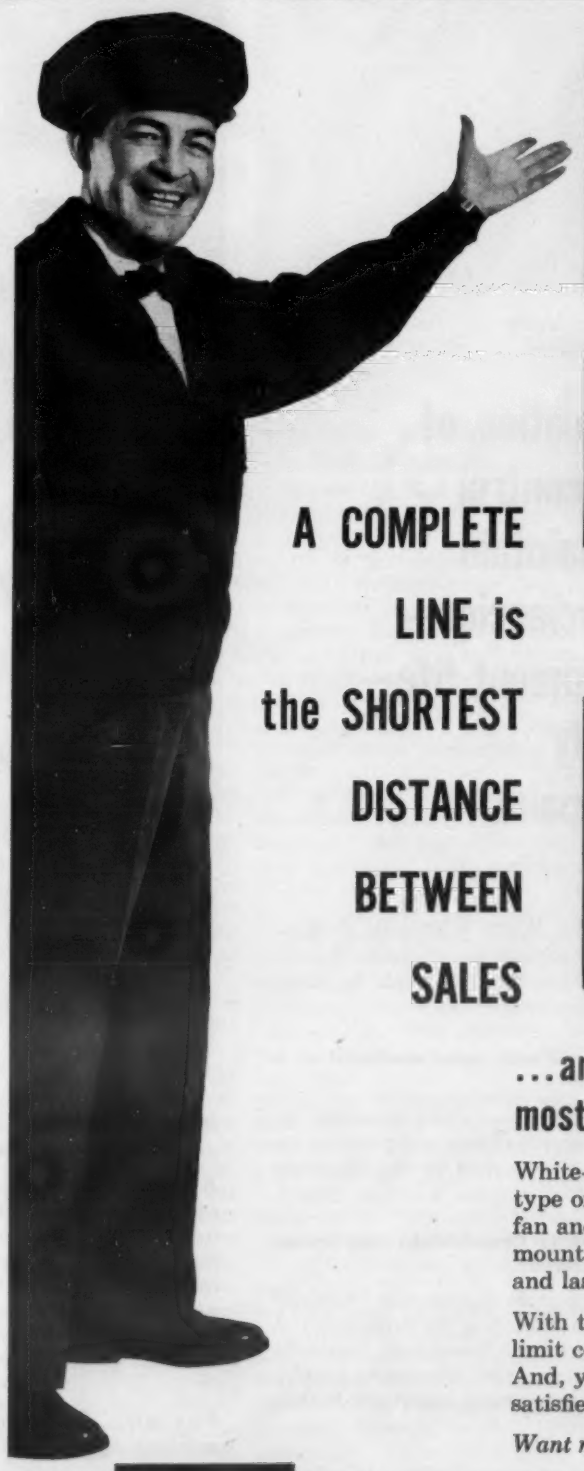
Three advanced courses in San Francisco at 55 Laguna St. are advanced refrigeration theory on Monday, application of automatic controls to heating and air conditioning systems on Tuesday, and heating, ventilating, and air conditioning on Wednesday.

Twice Burned Church Turns to Heat Pump To Reduce Hazards

DALLAS — An Episcopalian congregation, jinxed twice by fires which destroyed its church plant, has turned to heat pumps for year-round air conditioning.

Dutch Foerster, Texas Distributors' Longview Branch manager, suggested to the vestry of the Trinity Episcopal church that fire hazards could be minimized by installing a General Electric "Weathertron" heat pump system.

Convinced further by Southwestern Electric Power Co. officials, the vestry accepted Foerster's plan. Their educational building, completed last spring, includes five 10-ton and one 3-ton Weathertrons. The sanctuary is cooled by a 15-ton convention water-cooled system that will be converted to Weathertron at a later date.



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designed for narrow spaces

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White-Rodgers makes a fan and limit control to fit every type of furnace... and in every price range. White-Rodgers fan and limit controls are accurate and rugged. They mount interchangeably with other makes...go on in minutes and last for years.

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Independent Serviceman's Success Story

Tools and Instruments, Association Membership, Reading Trade Papers, and Record Keeping Listed as Keys to Success

There is some feeling in the refrigeration and air conditioning industry that the day of the small, independent serviceman is over. Many predict that the two or three or five-man shop cannot survive because it is becoming prohibitively expensive to train men and to equip them adequately to service modern equipment which is getting more and more complex and sophisticated. These people predict that centralized service by manufacturers or by giant independents is inevitable.

This is a story about a serviceman who disagrees.

By Frank J. Versagi

FIG. 1—Some of the instruments used by Danek and his men. Specific items may be identified by checking the photograph against the list which appears elsewhere in the article.

OWOSSO, Mich. — In July, 1952, Frank Danek entered the refrigeration service business with a borrowed $500, the family car, and half of his house basement for a workshop.

Today, Danek Refrigeration Service is the leading dealer/service organization within a 25-mile radius of this community of 18,000 and Danek is well known in Detroit, some 75 miles away.

The borrowed $500 has led to a gross business in the $50-$75,000 bracket; the car has been replaced by three service trucks; the basement workshop has given way to an 1,800-sq. ft. work building behind Danek's home. And Danek is a franchised dealer for Weber, Frigidaire, Trane, and Majonnier.

What accounts for Danek's obvious success? Enthusiasm and hard work are the words, but these are generalities; some specific examples:

Has Spent Over $1,000 On Instruments

1. Unlike so many small service shops which "can't afford anything besides the basic tools," Danek has spent over $1,000 on instruments such as temperature and pressure recorders, wattmeters, vacuum pumps, continuity testers, recording voltmeters.

2. An active member of both ASHRAE and RSES, he drives the 150 miles to and from Detroit twice a month to attend chapter meetings—regardless of weather.

3. Once when a new supermarket's well went dry three days before the grand opening, he used his pumping equipment and hoses (strung on crates over the parking lot) to supply water from some adjoining property until a new well was operating.

Reads Avidly

4. He reads avidly, testifies his wife and bookkeeper, Lora, a registered nurse. Danek can cite paragraphs from past NEWS Techcenters and news pages as though he were a proofreader on the paper.

5. Unlike fly-by-night outfits —who hurt the industry—he feels, Danek keeps accurate records of all his work and transactions. "Many's the time that a customer has called to complain about a unit we worked on 'a couple months ago' when our records show the last service call was more like a couple years ago," Danek says.

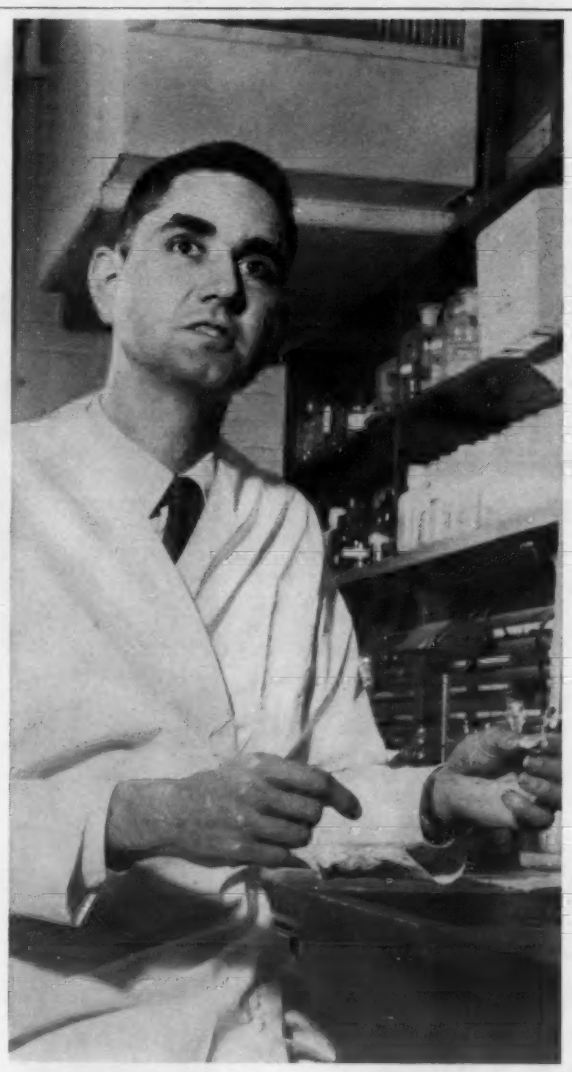
Danek has some 250 customers who include chain supermarkets whose equipment is out of warranty, air conditioning jobs in commercial structures, farmers (milk coolers and freezers chiefly). Some, such as the Wrigley food chain, have

Instruments Used by Danek Refrigeration
(A 3-Truck Service Operation)

Instrument	Approximate Cost
Compound Recorder—spring-driven	$ 50
Compound Recorder—electric-driven	50
Percentage Timer (temperature and running time)	50
Vacuum Testing Board	30
Kinney Vacuum Pump, with oil reservoir	250
7-Day Temperature Recorder, electric-driven	300
Recording Wattmeter	10
Snap-Around Ammeter	50
3-Position Thermometer (-50° to 1,000°)	95
Thermometer (-50° to 70°)	50
Continuity Tester	....
24-Hour Temperature Recorder	35
Volt-Ohmmeter	20
Recording Voltmeter	225
	$1,215

One in a series of interviews with the men who are "Virginia"

"Proper application of chemicals to control scale helps maintain operating efficiencies—prolongs equipment life—prevents costly emergency repairs"



Peter Eustis, Water Chemicals Product Manager, Virginia Smelting Company

Pete Eustis, head of the Water Chemicals staff at "Virginia," discusses the advantages of chemical scale and corrosion control, a service now offered by many refrigeration contractors.

Q Is it a difficult matter to add water treatment as a customer service?

A No, sir. Only a few items of inexpensive equipment are needed. Chemicals for the control of scale and corrosion are readily available—methods of application are relatively simple and can be easily learned.

Q Are there "Virginia" Water Chemicals to correct most of the problems encountered?

A Yes! You'll see them listed on the opposite page. "Virginia" has invested a great deal of research in the development of these products and has made them conveniently obtainable from nearby wholesalers. High quality, plus careful teaching of application methods, has contributed importantly to their success in the field.

Q Who do you think benefits most from water treatment service?

A Well, I'd say the equipment owner does. His equipment works better, lasts longer, and costs him less to operate. But the service organization profits too. Water treatment servicing provides an on-and-off season business, stabilizes income, and helps retain a full staff the year round.

Q Can a contractor or service company interested in adding this service get assistance from "Virginia"?

A Yes. For example, laboratory assistance in the form of water and scale analysis and treatment recommendations based on these analyses are provided free. Then there's literature for direct-mail promotion, service record forms, instruction manuals, all furnished without cost. Appointments with "Virginia" field engineers can be arranged to conduct actual demonstrations or to help with the really tough situations that sometimes develop.

Pete says, "*If you have a question about any phase of servicing water-cooled equipment, please drop us a line.*"

For free folder, "How to Turn Water into Money," write Refrigeration Division, VIRGINIA SMELTING COMPANY, 175 Jefferson St., W. Norfolk, Va.

WATER TREATMENT CHEMICALS • ESOTOO • V-METH-L • CAN-O-GAS • VASCOCEL
PRESSTITE TAPE • PERMAGUM • SUNISO REFRIGERATION OILS
NATIONAL SALES AGENT & REPACKER FOR DU PONT'S "FREON" REFRIGERANTS

their own preventive maintenance programs but use Danek for emergency service.

With the exception of freezers, he does no residential work. If the freezer requires extensive service, Danek takes it into the shop where he can work on it more efficiently.

Incidentally, he feels that freezer manufacturers would do well to place an access door near the drier or filter and capillary assembly on their units, since much unnecessary time is wasted getting to these high-service-frequency items.

Danek charges $5 per hour, plus travel time for service calls. While he supplies service on a 24-hour basis ("Anytime, Anywhere" was his motto when he first entered the business), he charges time-and-a-half for night work.

"This plus the increased reliability of equipment and a more knowledgeable public make night calls less and less frequent," Danek finds.

"Service contracts are hard to sell in this area. Actually, I don't have any," Danek says. "All of our service is done on a call basis."

Because he has "taken over" the area which he services, Danek does not pick up many new customers each year—about ten. Concerned, however, that some of his older customers may forget him, Danek is about to repeat the effort which got him off to such a good start in '52: he is going to make personal calls on his customers and leave his sticker on their equipment so they will know where to call for service.

He has put in four supermarkets himself and "all but built" a locker plant 30 by 50 by 14 ft. While air conditioning is less than 10% of his business, he handles over 300 tons in some seven establishments — again getting the service when the units are out of warranty.

To return to the specific items listed at the beginning of this article:

Uses Tools, Instruments

Danek bought his first instrument—a compound recorder—the very first year he was in business. "I can't see how anyone can do good, clean, confident service without them," he insists. "All of us in the service business have had jobs which we just couldn't figure out. I can't believe it's a coincidence that I have had less and less of them as I bought more and more instruments.

"The recorders, for instance, are invaluable for solving the difficult problem which would otherwise require a man to stay on the job for hours if you weren't just going to adjust a control and say a prayer."

The recorder, left on a job for 12 hours or overnight, gives Danek a graphic picture of the unit's performance during those hours.

On one particularly frustrating job, Danek began to suspect that the unit's controls were being tampered with by the customer, a tavern owner. The owner denied touching the unit, but Danek installed a recorder one night and the next day told the customer at what time he had played with the controls! That solved the problem.

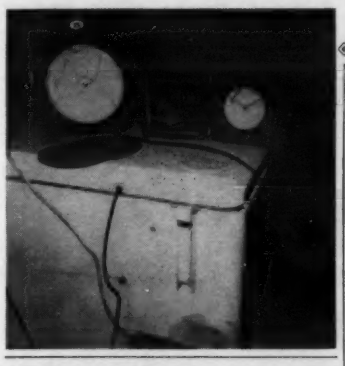
The recording wattmeter is a sure answer to complaints that a unit is "running all the time."

Danek places the wattmeter on the unit, leaves it as long as is necessary for the particular job—overnight to a couple days—then can show the customer exactly how much power was consumed in that time and from this determine how long the unit actually operated in the interval. The recording pressure or temperature instruments are also good for this purpose.

"One farmer was having trouble with his milk cooler; hard starting. He had refused to have a power line brought to his barn and wires carried the current from the meter on the house several hundred feet away.

"The recording voltmeter left on the unit a couple days clearly showed chronic low-voltage conditions, the voltage dropping as low as 180 at times." Danek uses a potential transformer with the recording voltmeter when he must work with higher line voltages like 480 volts.

FIGS. 2A AND 2B—Sometimes a regular gauge reading, as being performed above by Bob Buchele, does not indicate that anything is amiss, but the customer is chronically complaining about poor performance. In such instances, it is advantageous to leave recording pressure gauges on the unit several hours or overnight, as in 2b. The resulting chart then tells much about the behavior of the unit and permits accurate diagnosis of trouble.



Association Membership Is Valuable Help

One of the reasons Danek is well known in Detroit is that he is in the city at least twice a month at the chapter meetings of the Refrigeration Service Engineers Society and the American Society of Heating, Refrigerating & Air-Conditioning Engineers. Here he meets manufacturers' salespeople and engineers, other servicemen, wholesalers—a cross-section of the industry.

"One reason that many servicemen don't bother with society meetings," he opines, "is that they don't feel that they want to give away their secrets. On the contrary, I find that discussing problems and techniques with other people is very valuable.

"Then, too," he continues, "success, or even pleasure, in any business comes from dealing with people. The more people you know and meet with, the more likely are you and they to get mutual benefit from your meeting."

Danek has had several jobs referred to him by Detroit people whose only contact with him is at the association meetings.

(This story is a direct result of NEWS staff members repeatedly encountering Danek at RSES and ASHRAE meetings and becoming curious about his dynamic interest in the business.)

Danek's liking of people carries over to his customers as exemplified by his voluntary donation of his pumping equipment to the waterless supermarket.

Danek reads, and re-reads, trade periodicals. His reasons are several. Once again the interest in people makes him want to be aware of the goings on at pertinent companies. He is interested in how some of his competitors operate. He wants to keep abreast of new products, whether they be expansion valves or air conditioners. And he wants to keep his technical knowledge fresh.

"The week doesn't go by that I don't pick up a piece of important information out of the NEWS," Danek offers. "But I would subscribe even if I got only one or two such items a year. Where else can you get

(Continued on next page)

— ESTABLISHED 1952 —
Danek Refrigeration Service
COMMERCIAL — INDUSTRIAL — INSTITUTIONAL
PHONE SA 5-5920
1025 E. MAIN ST. OWOSSO, MICH.
EXPERIENCE HAS NO COMPETITORS

IN ADDITION to leaving his label on jobs he has worked on, Danek uses it in his calls on new and old customers—leaving it near the telephone, say—thus increasing his chance of getting the next service call.

FIG. 3—Danek watches his recording voltmeter in an attempt to determine if starting difficulties are due to low voltage conditions. Left long enough on the unit, the recorder tells what voltages were reached at what time of day or night.

"VIRGINIA"
Water Treatment Chemicals

Scale & Corrosion Inhibitor
Glassy polyphosphates in nut-size crystals provide slow, controlled solubility. No mechanical feeding devices needed. Inhibitor holds scale-forming solids in suspension or solution. Deposits thin protective film on metal to stop oxidation. Has neutralizing effect on weak acids. Prevents tuberculation buildup on iron surfaces.

Chilled Water Treatment
For closed recirculating systems, warm or chilled. Is compatible with all antifreeze solutions. Forms protective film on metal. Prevents rust or tuberculation of metal surfaces. Functions as rust preventive.

Algae-Cides No. 1, No. 2 and No. 3.
#1—A crystalline, organic copper compound, toxic to most kinds of algae. #2—A combination of organic compounds, toxic to both algae and slime, including copper-resistant algae. #3—A quaternary ammonium liquid concentrate, for use where #1 or #2 does not destroy growths.

Also—"Virginia" Liquid and Solid Scale Removers, Ice Machine Cleaner. Ask for "Virginia" products at any leading wholesaler's.

Refrigeration Division
VIRGINIA SMELTING COMPANY
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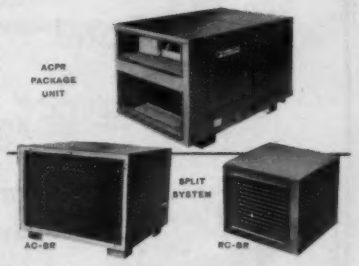
VIRGINIA® Chemicals

Available in Canada and many other countries

NEW PRODUCTS

These brand-new units open new markets, protect old markets for you!

Heat Pumps—Package and Split-System Models—They heat and cool for year-round comfort!—Both models are factory-assembled and pre-wired, ready to install. The ACPR goes in an attic, basement, crawl-space, transom or central hallway. The Split System consists of the AC-BR Unit (installed outside the house) and the RC-BR Inside Unit (mounted in the duct system), with its self-contained, high-capacity blower. American-Standard Heat Pumps are available in 2, 3, 4 and 5 h.p. A single automatic thermostat provides the desired temperature in both summer and winter, by means of an automatic gas-reversing valve. The units have a De-icing System, which prevents ice build-up, and a Double Drain Pan, which saves you work and money on installation. A Supplementary Electric Heater is available in four capacities—13,648, 27,296, 40,944 and 54,592 Btu—with step-by-step cut-in control of the elements to prevent overloading the power line.



Weather Station—Top-quality comfort control your customers can see!—The American-Standard Weather Station is a profit item that sells on sight! It puts controls and weather instruments all in one visually dramatic package. It prompts home owners to brag about the wonderful heating and air conditioning system *you* installed. The Weather Station is simple to install. Push buttons set the system for heating, cooling or air circulation and filtration only. A clock-thermostat maintains temperature control, with automatic night set-back. There's a warning light that signals when filter needs changing.

Electric Furnaces (Upflow & Downflow)—New-fashioned heating plus traditional quality!—These furnaces come completely assembled, ready to connect to a power supply. They are factory-wired for 82,000 Btu; simple reconnections can reduce capacity by steps down to 41,000 Btu. Each unit comes in two models; one for use with a 2- or 3-ton "add-on" cooling unit, and one for use with a 5-ton "add-on" cooling unit. Both models are compact enough for installation in closet, alcove, hallway or basement . . . with no flue required. And the control panel swings out for easy servicing.

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AMERICAN-Standard
AIR CONDITIONING DIVISION
ELYRIA, OHIO

Serviceman--

(Continued from preceding page)

money saving ideas or leads on business so cheaply?"

Danek's first year's records, all of them, were kept in a single spiral notebook. Now his office, located in his home in front of the workshop, makes use of efficient forms and records. His work order is tightly but efficiently organized.

For example, since many of his customers are farmers "who have no house address" a blank is left on the form for directions like "turn left two miles past the red mill."

Where a motor change is called for, he keeps a record of the model, serial number, and size of both the motor removed and the motor loaned, so he knows where his motors are.

He instructs his workers to fill out the "Work Performed" section "with as many words as possible." This is for psychological reasons; a customer tends to be dubious if the work is merely described as "found plugged cap tube, replaced same." That just doesn't sound like very much work.

FIG. 4—A partial view of the motors kept on hand for replacement or loan to customers. Detailed identification records are kept on each motor so that Danek knows where each motor is.

Lora, Danek's wife and bookkeeper, points out that service is gaining on sales in the percentage breakdown of the business volume.

"A major reason for this," she feels, "is that we have saturated the area with new condensing units in the past several years, and it will be a while before they must be replaced."

Danek keeps about 15 condensing units in the shop, along with some 50 motors of all types, for replacement and loan.

Between the workshop and the home office there is an intercommunications system adapted by Danek from two World War II German field telephones. He has considered equipping his trucks with radio but feels that the economics don't justify it.

He is influenced, too, by the fact that the local utility has just removed radio from its fleet of trucks after finding them uneconomical.

You Asked About It

From the many requests for information it receives, the NEWS will select and publish some of general interest. In many instances, the answers will be supplied by authorities in the industry.

Q. I would like to question a statement made in the Feb. 15 issue on Applied Electrical Theory (10). The point in question was "Two light bulbs in series of equal wattage across 240 volts will burn at full brilliance, across 120 volts the lamps will burn at ½ brilliance." Shouldn't the brilliance be only ¼ at 120 volts?

Let's use 60 w lamps at 120 V.

$W = 60$ watts

$E = 120$ volts

$$I = \frac{W}{E} = \frac{60}{120} = .5 \text{ amps}$$

$$R = \frac{E}{1} = \frac{120}{.5} = 240 \text{ ohms}$$

Two 60 w lamps having a resistance of 240 ohms each in series would have a connected total resistance of 480 ohms.

$R^1 + R^2 = TR$

$240 + 240 = 480$ ohms

on 240 volts

$E = 240$ V

$R = 480$ ohms

$$W = \frac{E^2}{R}$$

$$W = \frac{57{,}600}{480} = 120 \text{ W, same}$$

total as two 60 watt lamps

On 120 Volts

$$W = \frac{E^2}{R} = \frac{14{,}400}{480} = 30 \text{ watts}$$

total or ¼ of brilliance of the 240 V. hook-up.

I look forward to receiving your paper every week.

Frank Richey, Tucson, Ariz.

A. Norman Brown, electrical instructor at Cass Technical High school, Detroit, answers, "The gentleman is correct. If the resistance is the same and the voltage is cut in half, the current is decreased by one-half —making the power about one-fourth."

It would have been better in the article to have used a term such as "less brilliance" or "lower brilliance," rather than "half brilliance."

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Exploding Middleman Myth

Wholesalers Operate on Net Profit of 2.27% Before Taxes, NAW Study Shows

WASHINGTON, D. C. — The National Association of Wholesalers (NAW) has released a comparative performance analysis covering 22 national wholesale commodity lines whose average net earnings before taxes were 2.27% of sales for the year 1958.

Among reporting associations were the Air-Conditioning & Refrigeration Wholesalers, Central Supply Association, National Association of Electrical Distributors, and Northamerican Heating & Airconditioning Wholesalers.

The survey covered all types of commodities from farm equipment to beer and food, it was pointed out. Individual commodity-line earnings, before Federal income taxes, ranged between a low of 1.05% and a high of 4% of sales, according to the NAW.

The survey table shows earnings of 81,842 wholesale corporations, as reported in "Statistics of Income, Corporation Income Tax Returns," published by the U. S. Treasury Dept. IRS (1957-58), which averaged only 1.90% of gross sales as net earnings before Federal income taxes.

It was also noted that 138,566 manufacturing corporations, as reported in the same Treasury report, earned 7.07% on gross sales and 178,493 retail corporations earned an average of 2.20% of gross sales, all net before taxes.

* * *

Comparative Performance Analysis
22 National Wholesale Associations

PER CENT OF SALES

Association	Net Sales 100%	Cost of Goods Sold %	Gross Margins %	Total Operating Expenses %	Other Income or Expenses (+ or — %)	Net Profit Before Taxes %
A	100	85.39	14.61	12.68	—0.71*	1.22
B	100	79.76	20.24	18.49	+0.10	1.85
C	100	83.42	16.58	14.28	+0.22	2.52
D	100	77.42	22.58	21.86	+0.44*	1.16
E	100	81.69	18.31	17.03	NS	1.28
F	100	82.58	17.42	13.42	NS	4.00
G	100	79.12	20.88	18.55	—0.23	2.10
H	100	77.57	22.43	20.95	+0.97	2.45
I	100	93.35	6.65	6.43	+1.08*	1.30
J	100	71.64	28.36	25.54	+1.04	3.86
K	100	81.96	18.04	15.49	+0.12	2.67
L	100	81.35	18.65	17.21	NS	1.44
M	100	77.83	22.17	18.63	—0.34	3.20
N	100	89.11	10.89	9.69	NS	1.20
O	100	83.50	16.50	12.60	NS	3.90
P	100	83.53	16.47	13.03	—0.42	3.02
Q	100	77.33	22.67	18.56	—0.82	3.29
R	100	72.28	27.72	26.02	+0.58	2.28
S	100	77.60	22.40	18.80	—0.20	3.40
T	100	78.41	21.59	20.54	NS	1.05
U	100	84.60	15.40	14.30	NS	1.10
V	100	84.30	15.70	14.30	+0.30	1.70
Average 22 Associations (A-V)	100	81.08	18.92	16.75	+0.10*	2.27
Av. Merchant Whle.-Corps. (81,841)	....	....	....	....	....	1.90 (1)
Av. Manufacturing Corps. (138.566)	....	....	....	....	....	7.07 (1)
Av. Retail Corps. (178,493)	....	....	....	....	....	2.20 (1)

(1) As a per cent of "Gross Sales" from "Statistics of Income—Corporation Income Tax Returns, U. S. Treas. Dept. IRS (1957-58)."

NS—Not shown.

* Estimated ("other income or expense" data not shown).

"The survey shows that the average cost of goods sold by the 22 wholesale commodity-lines was 81.1% of sales; gross margins were only 18.9%, and total operating expenses averaged 16.7% of sales," the NAW said.

"Other income and expenses, mostly financial operations, added 0.07% of sales to net earnings before taxes, bringing total average net earnings before Federal income taxes to 2.27% of sales for the reporting commodity groups."

In releasing the figures, NAW President W. D. Jenkins, electronic wholesaler of Richmond, Va., said, "Too many people seem to feel that wholesalers or distributors, so-called 'middlemen,' are somehow responsible for high prices. Obviously, nothing could be further from the truth.

"We Americans are justly proud of the tremendous improvement in the efficiency of our national industrial establishment. We read almost daily of the increased productivity of our nation's manufacturing plants.

"The facts are, however, that the most efficient, highly automated mass-production system in the world would be useless to the nation's consumers without its being backed up by an equally efficient, highly-productive mass-distribution system. The increased efficiencies developed in our national distribution system in the past few decades have more than kept pace with our constantly increasing manufacturer-productive capacity."

To prove his point that distribution, and particularly wholesale distribution, has greatly improved its operating efficiency, Jenkins cited the latest census figures.

"In 1939 the Bureau of Census listed 100,000 'merchant' wholesalers as doing $22.5 BILLION of business with 1 million employes. Fifteen years later, 1954 census figures showed 156,000 'merchant' wholesalers, doing $101 BILLION of business with 1.75 million employes."

Jenkins added, "Thus we see the number of wholesale establishments in the U. S. increasing by 65% while the dollar volume of merchandise handled increased by over 350% and the number of employes increased by only 71%."

Pointing to the nation's growth in gross national product, the NAW president added, "The past 20 years have seen a phenomenal growth in gross national product of 480% in the U. S. During the same 20 years, merchant wholesalers have increased their volume by a whopping 555%."

Jenkins continued, "The nation's wholesalers are proud of the record of accomplishment revealed by this performance analysis. There are over 185,000 merchant wholesalers in America today and they will handle close to $125 BILLION in goods this year. They extend a continuing line of credit to their customers of over $13 BILLION and warehouse over $14 BILLION of the output of the nation's factories and farms within easy reach of consumers.

"When you stop to consider the myriad services rendered to both producers or manufacturers, on the one hand, and industrial users—retailers and consumers—on the other hand, by the nation's wholesalers and realize that as a group they operate on a margin of less than 19% of sales and manage to earn only a low amount, approximately 2% on sales, the high rate of efficiency of their operations becomes obvious."

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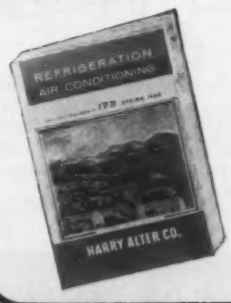

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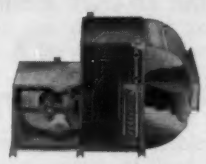

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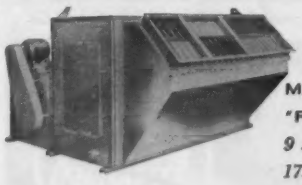

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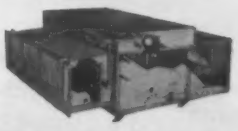

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Builder and Buyer Reactions

Present Status, Future of Home Conditioning Discussed by Builder at York Forum (1)

Some frank talk by a builder who has had considerable experience with residential air conditioning, about its present status and future possibilities, with some interesting sidelights on builder and home buyer reaction to some of the factors in installing and using air conditioning, will be found in the accompanying report, to be published in two parts.

This report comes out of a transcript of the conversations at one of the "Customers' Forums" which have been arranged by York Div., Borg-Warner Corp. to get some information and first-hand expressions of opinions from some major factors in the purchase of various types of air conditioning.

This particular forum was devoted to the residential field, and the principal participant was Leon Weiner, president, Franklin Builders, Wilmington, Del., and a pioneer in offering central residential air conditioning to home buyers. With Weiner was Max Glazar, head of Glazar Bros., Wilmington air conditioning dealer who has made the installations in the new homes. Others taking part included York Div. officials and Octave J. Peppo, The Electric House, Inc., New Orleans, who was in York at the time the forum was held.

W. T. Goldsmith, Mgr., Residential Heating & Cooling Sales, York

In looking at home builders in total, we are looking at the biggest industry in the United States. The home-building industry is far bigger than the automobile industry ever dreameded of being or ever will be. The home building industry is vital to us.

New Homes Studied by Existing Home Owners For Modern Ideas

The reason it's vital to us is that we have a product which represents a better way of life for most American people. And this better way of life should certainly be found in as many new homes, before it is found in existing homes.

Let me tell you the influence the new home has on the existing home: Most home builders sell their product from displays —just like every other retail dealer in the country. Their show-window, though, represents a case of products—all wrapped up into what they call the model home. And with due promotion, due dressing up, hundreds—and even thousands —of people visit these model homes.

Out of every hundred people that visit a model home, only seven are interested in buying a home. The other 93 people are interested in improvements in their own home. The home builders are the biggest sellers of built-in ovens, built-in dishwashers, garbage disposal, and appliances of that type. It was only through the home builders' utilization of those appliances that the businesses we see today —that we call "home improvement businesses" — got into those kinds of products. And it was only when people saw these kinds of products in new homes, that they wanted them in existing homes.

Such is the case with air conditioning. As people see more and more air conditioning in new homes, they want it in existing homes. This is why we direct much of our promotional effort at the new-home builders.

About three years ago, the head of the FHA made the statement: "Any home built in the next five years without air conditioning would be obsolete." Actually, the FHA official made the statement about two years after our guest speaker made it. Our speaker was one of the first people in our country, and in his industry, to see the desirability, the need, the benefits of residential air conditioning. His name is Leon Weiner, and he is president of Franklin Builders, Wilmington, Dela.

Franklin Home Builders have built probably a total of 2,500 homes—many of which are air conditioned.

Contractor's Role In Success Cited

Between us and the builder is a pretty important guy who installs the product. If the ducts are sized properly and the registers placed properly and the air balanced properly, we can have an awful lot of trouble. And certainly, one reason that Mr. Weiner, and people like him, continue to use our product, is because the people who sell it to him and install it for him do the kind of a job to make it a quality installation, and tonight we are very fortunate in having with us Max Glazar, president of Glazar Brothers in Wilmington. I guess Max installed the first York air conditioner in a Weiner-built home and is still installing air conditioners in the Weiner-built homes.

Leon Weiner, President, Franklin Builders (speaking)

Starting off with the concept of a home and the building of a home was a guy who knew how to take all these jimjacks and all these gimmicks and little pieces of wood and cornices and fancy balustrades, and put them together. This became the idea of the skill and the know-how that made the difference between a home builder and the guy who could just put up four walls as shelter.

Since the war we've gotten away from the idea of these jimjacks and began to get into the idea of a home as something that was a little different from what it used to be. We began to think of the home as an industrial designer would, in approaching a product; its use and its function; its relationship to the family.

Gradually we got away from the idea of the old home builder who was only concerned with his skill and dressing it up and putting gingerbread on, and began to look at the purpose of the home. And briefly, the present purpose of a home is to provide shelter and comfort to the family and for its uses; its social and family uses.

Home Has Now Become Servant Instead of Homeowner Being Slave

An industrial designer who spoke to the home builders association, pointed out that a home used to be a place in which basically the homeowner was a servant and had to hang around in order to service the home—maintain it. Today, the home has become a servant to the man.

By illustration, if you had a furnace, you had to put coal into it; today, you set a thermostat. In the old days, you wanted hot water, you had to go put a little coal into the one-a-day burner and make sure the water was there, and so on. Today, you've got automatic hot water. The same with a stove; you had to chop the wood for the stove. All of the equipment in a home today has become pretty much automatic and is designed to serve the occupant of that home automatically and instantaneously.

Heat Pump Cited

We are rapidly moving into new spheres and ideas. You who are associated with air conditioning are well aware of the supposedly, or at least the outward miracle of the heat pump, and to many people who are not familiar with air conditioning or the principles of the heat pump, this is a mirable that is virtually inexplicable.

But basic in our thinking in residential comfort is the fact that the air in the house needs to be handled and treated as to give the maximum comfort and you can't do that with hot water conveniently; you can't do it with steam virtually at all; and with this electric baseboard heating or electric element heating, it's also difficult unless you do it in such a way that it involves the movement of air and then I'm not so sure that the expense is not too great.

The treatment of the air with regard to its humidity, its temperature, either for cooling or heating, its cleanliness, the removal or insertion of odors is very important. It is frankly, in my opinion, a very vital thing which has not yet been exhausted and which leaves a lot of work and activity before it can be satisfactorily dealt with at the home level.

Installed First Air Conditioning In '52

In 1952 we undertook our first major development in residential air conditioning. There was only one basic reason that we undertook it aside from the other factors that may exist. We were interested in seeing a better home, better living. There was another basic reason —sometime after the war, within two or three years prior to 1951 or 1952, the heating system using forced warm air had

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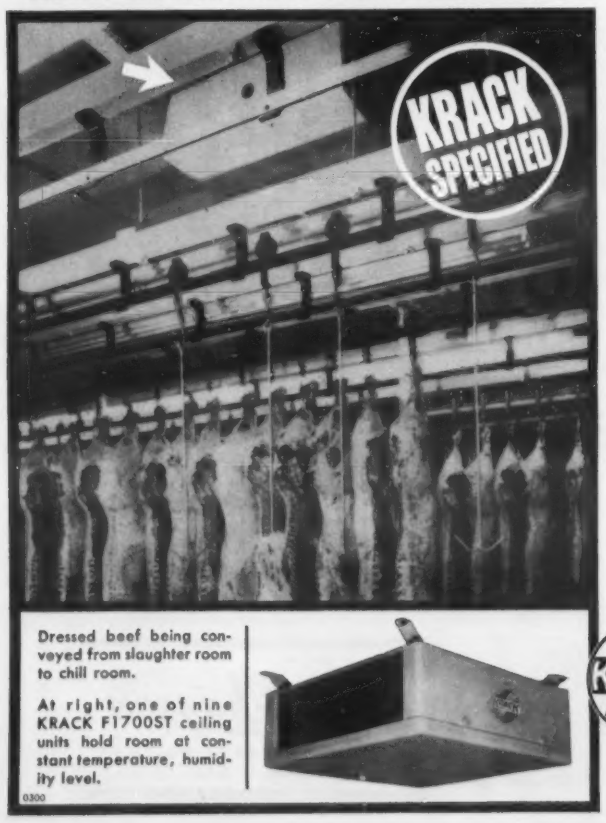

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reached some degree of maturity.

It took hold and we were walking around preening ourselves, we were building a development and we said that in five years a house that doesn't have air conditioning is going to be obsolete.

It hasn't happened. Five years came and went and in 1957 and in '58 and, today, in 1960, a house that doesn't have air conditioning is not yet obsolete. Now something's wrong. Something's basically wrong. I remember when we talked about leaving out the windows, just using panes of glass, no operators. We said,

5 Years Has Not Lead To Elimination of Window Operators

"What do you need windows for? We've arrived. We have *the* method for treating the air in the summer and in the winter."

Obviously, we hadn't arrived, because I'll tell you right now, I'm not ready to live in a house myself where there are no operators on those windows. I was—in '52. This means that, and I think it's characteristic of many things in science and life, you begin to think you see the answer and you get cocky about it. In those days, we talked about the need for an electronic air cleaner or filter, but said that was incidental. Today I think it's vital and important.

The matter of humidification of the air is equally as important as dehumidification of the air. I believe that the spread of some of these viruses, bugs, or whatever you call them is tied up with this.

I've deliberately stayed away from the question of cost for one reason: I am assuming that there is a clear understanding that unless this is economically feasible then we are kidding ourselves. Unless it is economically feasible, we are deluding ourselves.

Merchandising Is Great Need Today

The problem that faces all of us in this industry is the problem of better integrating not only the question of cost, but a question of merchandising and selling. The importance of merchandising that product to the people who are going to buy a home as well as toward developing the kind of a home and the kind of a package and the kind of a look at the future in which the man who doesn't buy that kind of package is being short sighted. This is also part of selling.

Now, if people in our country, people in our advanced way of life do not accept these things on the merits themselves, I think there has been a tendency on the part of the air conditioning industry, on the part of the home builders, and the part of many others to think that everybody's going to *recognize* that having air conditioning is a highly desirable state of affairs.

I don't think the television people have done that. I don't think the washing machine people have done that. I don't think the automobile industry has done that; and I don't think that anybody else in any other industry has taken quite the complacent look at the problem of the home as have the home builders and I place us in the responsibility, in the forefront, as well as the manufacturers of home equipment.

We have learned, in the last few years, to work together on these things. We have learned that our interests are more closely tied. The manufacturers of component parts and products which go into the home and the home builders themselves are essentially and basically part of one industry. And, until we learn how to integrate that, both the merchandising, the cost, the economic feasibility, and the problems, we are still going to continue in a situation in which there is going to be a small amount of air conditioning, a smaller number of homes bought than automobiles.

There are a hell of a lot of automobiles bought every year. They're cheaper. But that isn't the answer. The answer is that we have not yet learned as an industry to look ahead, look forward, and sell ourselves to the public.

Ben Williams, York

I heard just this afternoon a man say that anyone who had never driven an air conditioned automobile would never be without one again. Do you find that true in the residential field—that people who have lived in an air conditioned home would never be without it?

Weiner (replying)

My experience on that is that it is pretty true, the best illustration of the type of a job that the air conditioning does for the second home buyer who has had it in his first home is perhaps illustrated by the garbage disposal industry. We have found that once a family has a garbage disposal unit and had used it they either miss it very badly or they are sure they have it in the next home they move into even if it's an old home and if it's a new home they'll insist that it be connected in. This is not quite as true about air conditioning but we have found that it is very close to the garbage disposal situation.

The answer is that once anyone has lived with air conditioning even in our climate here, it's true they still want it unless they move out on the top of a hill or in the middle of the woods or something like that. We have had people who have bought their second and occasionally their third home from us and if their second home was air conditioned they want their third home to be air conditioned.

Dave Brenneman, York

What finish quality does a home buyer expect such as a furnace without spot-weld marks, scratches on the metal and things like that?

Max Glazar, Pres., Glazar Bros., Wilmington Dealer (replying)

When equipment is shipped in no one knows what condition it's in until its uncrated, sometimes not speaking of any particular builder, some builders don't leave us facilities for placing equipment in basements, we have to use narrow cellar stairways and it creates quite a problem and we do scratch them up.

What we do depends on the amount of damage. We either replace a panel or if we have enough paint furnished to us by York, or whoever the manufacturer may be, we touch up these things.

The reason we do that is that a new home buyer is a very critical buyer and will notice any scratches or spot-welds because today they are educated. It's a buyer's market and they come into a house with a list and look for all of these details and we do have to correct them because I say about 90% of them notice it.

Weiner

As a home builder I would like to be able to say to you—to hell with the scratches and the spot-welds and to hell with using this real heavy gauge metal that isn't necessary, but you have to do it because somebody will come along—bang—bang—and want to make sure they can't put their fist through it. So you are forced to use a heavier gauge metal for your casing and your cover and every time they go on strike in the steel plant they raise the price and we get a price increase from you.

A lighter gauge metal would be perfectly fine for a cover. Nevertheless we have got to face the fact that we have trained our American public to look for that shiny chrome that's on the automobile. That will sell it. Someday I hope it won't be that way.

(To Be Continued)

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TECH CENTER

by Frank J. Versagi, Technical Editor

Heat Pump Defrost

Problems with defrost control were listed as one of the most important factors in heat pump development by distributors quoted in the Sept. 21, 1959 Heat Pump Issue. Also in that issue, the Techcenter discussion of heat pumps listed the chief methods of de-icing and cited their advantages and disadvantages.

Mechanical Cooling Co., Inc., of Houston, Texas, submitted the details of a defrosting system which they feel has good possibilities, even though their own tests have so far been restricted to heat pumps with expansion valves and have not been conducted at all the conditions which a heat pump may encounter.

The NEWS asked one of the country's leading authorities on heat pump control for comment, sent the comments to Mechanical Cooling, and received their reaction.

Because the general subject of heat pump defrosting is so important, the NEWS here summarizes the submitted de-icing system and the resulting comments. Knowledgeable readers who care to enter or amplify the discussion are invited to submit their thoughts.

* * *

Basic to the discussion is the fact that the heat pump makes reversible use of its two heat exchangers, the inside coil and the outside coil. On heating duty, with the outside coil acting as an evaporator, the temperature difference between the air stream and the refrigerant in the tubes is from 10-20° F. Thus, when ambient drops to 40° or lower, refrigerant temperature drops to 30° or lower, and ice formation begins. Sometime before the outside coil becomes so blocked with ice that air cannot be drawn through it, the coil must be de-iced.

The switching mechanism used by Mechanical Cooling uses pressure activated switches to produce the refrigerant flow reversal which causes the compressor to pump hot gas to the outside coil, then restore the system to normal operation. The company felt the necessity for several reasons to depart from the most commonly used temperature differential switch, which reacts to the **temperature difference** between the air stream and the refrigerant, **not to the actual temperature.**

According to Mechanical Cooling, these are the disadvantages of a temperature differential switch:

1. Difficulty in securing good thermal contact of the sensing bulb and coil tube. The degree of intimacy of contact can vary the sensed temperature by as much as 5°.

2. Inaccessibility of the tube surface where bulb must be attached makes servicing or replacing the switch awkward.

3. Differential switches must be adjusted to the characteristics inherent to a particular make and design.

4. Temperature sensing switches are generally not as reliable and do not retain their accuracy as do pressure-actuated switches.

"Since there is a direct relationship between temperature and pressure of a refrigerant," says C. G. Shaw, of Mechanical Cooling, "it is entirely practical to employ pressure-actuated switching mechanisms to accomplish de-icing."

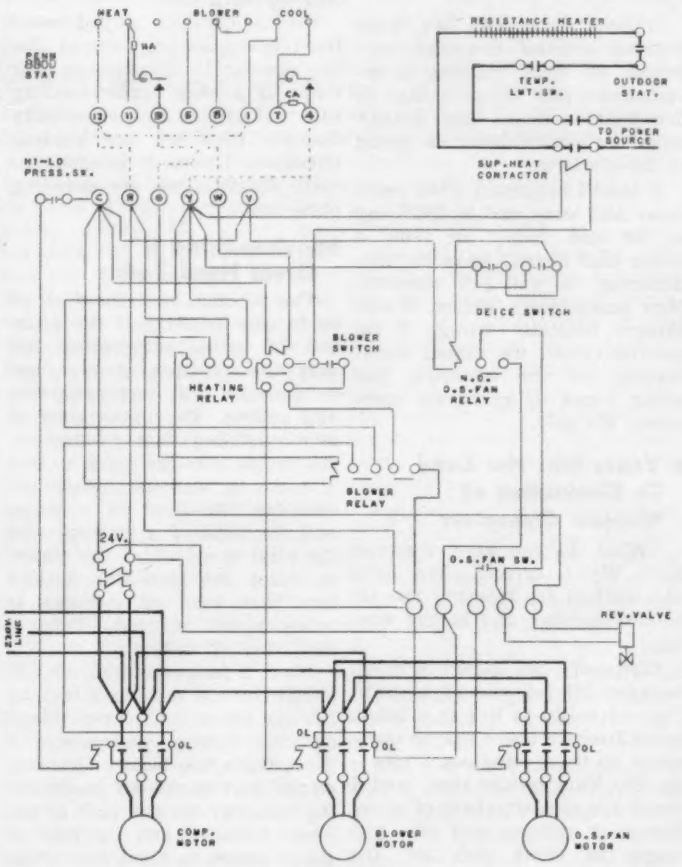
The original mechanism described to the NEWS made use of two pressure-actuated switches, one mechanically connected to the refrigerant line of the outside coil and the other to the refrigerant line of the inside coil. The switches are connected electrically in parallel; both switches must open to break the circuit; one switch, alone, can make the circuit.

The switch connected to the outside coil is set to open at 55 p.s.i., equivalent to 30° (R-22). According to Shaw, their experience has shown that the outside coil must reach 75° for de-icing to be complete, so the switch is set to close at the equivalent pressure of 134 p.s.i.

On the units involved, the temperature of the refrigerant in the inside coil is somewhat above 110° when the outside coil is free of ice. Should this temperature fall much below 106°, the air supplied to the heated areas would be too cold to serve its purpose. Therefore, the switch connected to this coil

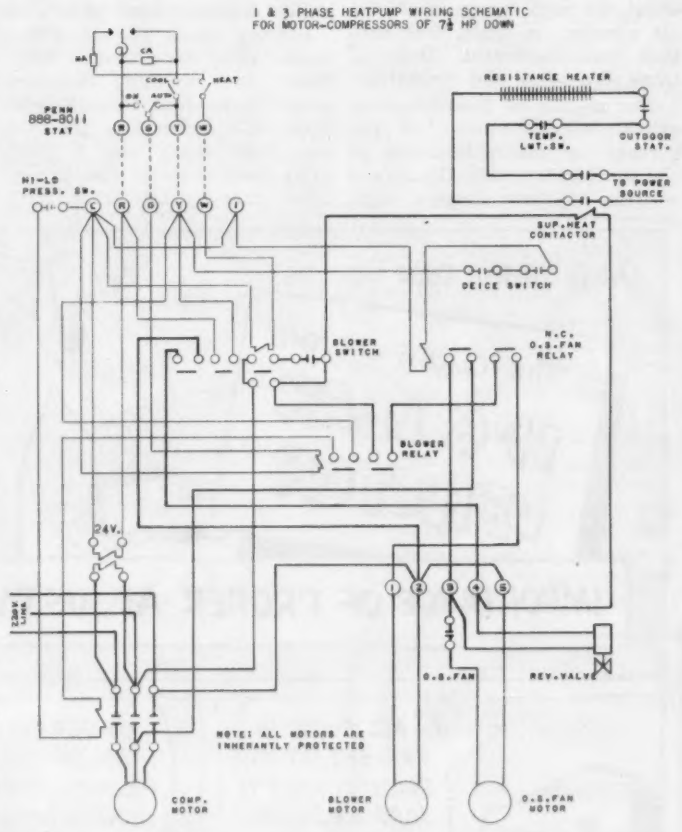
(Continued on next page)

3 PHASE HEATPUMP WIRING SCHEMATIC
FOR MOTOR-COMPRESSORS OF 10 HP UP



* * *

1 & 3 PHASE HEATPUMP WIRING SCHEMATIC
FOR MOTOR-COMPRESSORS OF 7½ HP DOWN



The Complete De-Icing Cycle, Step-by-Step

(1) Suction falls to 55 lbs. (30° F.) outside coil de-icer switch opens. System is notified that ice could form and that de-icing may be necessary.

(2) Ice forms, pressure drops to 216 lbs. (106° F.), inside coil de-icer switch opens, system reverses, blower and fan stop.

(3) Pressure in inside coil continues to drop, at 221 lbs. (108° F.) blower switch opens. Nothing happens as blower is already off.

(4) Pressure in outside coil rises to 134 lbs. (75° F.), outside coil de-icer switch closes, system returns to heating.

(5) Pressure in inside coil continues to rise, inside coil de-icer switch closes at 246 lbs. (115° F.).

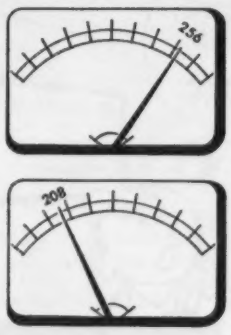
(6) Pressure in inside coil continues to rise, blower switch closes at 251 lbs. (117° F.), blower resumes operation. De-icing and system restoration to heating is complete.

When The Line Voltage Measures

Above Normal

or

Below Normal



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An air conditioning unit with a motor designed for 230 volts operation will lose torque, overheat or cycle off-and-on if operated from a circuit below the nameplate rating.

A Buck and Boost transformer connected to a 208 volt circuit and adjusted for a 10% boost will supply 228.8 volts which is entirely satisfactory for 230 volt motor operation.

If operated on excessively high voltage the motor will run hot, windings char and finally burn-out and the cost of consumed electric current will be higher than necessary.

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(Continued from preceding page)

is set to open at the equivalent pressure of 216 p.s.i. In practice, the setting will be made by the leaving air temperature, due to variations in unit designs.

Sequence of Operation Of Pressure Switches

Describing the sequence of operation of the pressure switches, Shaw says:

Assume the prevailing ambient is 50°. No de-icing will be necessary. When the ambient drops to such a point that the refrigerant in the outside coil reaches 30°, the pressure is 55 p.s.i. and the switch connected to this coil opens. Since not enough ice has yet accumulated to retard heat flow, the switch on the inside coil remains closed and the system continues to operate, supplying heated air.

As ice accumulates on the outside coil, the temperature and pressure of the refrigerant in the inside coil drop and when the pressure reaches 216 p.s.i., the switch on this coil opens and the system reverses.

The series on "Applied Electrical Theory" will resume next week.

The outside coil now receives hot gas, its temperature rises, and the ice melts. When the refrigerant reaches 75°, 134 p.s.i., the switch connected to the outside coil closes and the system is returned to heating service. The switch connected to the inside coil will remain open until the pressure reaches 246 p.s.i., when it will also close. Repositioned, the controls are ready for the next cycle.

Originally, Shaw indicated that when the system has been shut down during the winter and the space is unheated, the pressure-actuated system would go through a de-icing cycle on start-up, even though no ice were present. "When the pressure in the outside coil reaches 134 p.s.i., the system will adjust to heating," Shaw said.

Start-Up In Low Outside Ambients with Low Inside Room Temperature

On the subject of start-up in low outside ambients and with a low inside room temperature, the heat pump control authority offered: "Under such conditions there may not be sufficient pressure in the system to raise the outside coil pressure enough to place the unit in the heating cycle. Also at low outside temperatures, there may be a condition where the pressure control on the inside coil will not reach 246 p.s.i., 115°, before the outside pressure control goes below 55 p.s.i., 30°, with no ice buildup on the outside coil. This results in a false de-ice or possible short-cycling of the unit."

Prior to receiving these comments from the authority, Shaw wrote the NEWS, "We have discovered a need for improvement in our de-icing system. When the system is started from a cold ambient and with a cold room, too, the refrigerant condenses too fast and will not permit the head pressure to build up. Result is a false de-ice cycle.

"We altered the electrical circuit, added another pressure switch, and solved the problem as far as we can tell."

"We have installed an additional, open low, pressure switch with the bellows also connected to the inside coil. This switch is set to open at 221 p.s.i. and close at 251 p.s.i. It cycles the inside fan on reduction of pressure, independent of the outside fan. This arrangement serves to stabilize discharge pressure as well as prevent the diffusion of cold air to the room immediately following de-icing. This switch is out of the circuit on cooling.

Continuing with the original submission, Shaw stated, "The foregoing discussion assumes that switches are normally closed when the system is operating on heating and that switches must open to initiate de-icing. Some heat pump control circuits require normally open contacts for heating and closing the contacts initiates the defrost cycle. For this reason, a switching mechanism designed for defrost control could be of the double-throw action. Close-on-low switches must be electrically connected in series.

"The pressure-actuated mechanism described makes use of standard, readily available pressure switches. The application of the switches for this purpose takes advantage of the critical temperature areas in the operation of air-to-air heat pumps. This mechanism can also be used in defrosting commercial and industrial low temperature refrigeration systems."

In addition to the comments already cited, the control authority who evaluated this submitted de-icing system made other statements.

"At low outside ambients when supplementary heaters are being used inside, there may exist a condition where the inside pressure may not drop to 229 p.s.i., 110°, yet the outside pressure control has dropped below 55 p.s.i., 30°, due to the ice blanket on the outside coil. Thus, no de-ice initiation when needed."

According to Shaw, this problem has never occurred. "It seems to us, that the problem posed by the authority would depend on the location of the supplementary heater relative to the inside coil, rather than on the type of de-icing system used."

The evaluator cited the great difference in operation of systems using capillary tubes and those using expansion valves. **"Operation of the de-icer system may vary greatly when used on self-contained and remote systems. It is our opinion that this system should be tried on all types of systems and under all operating conditions before data is released for publication."**

Shaw replies that he believes "the manner in which we are approaching the de-icing problem is an improvement over that which is available, but we agree that considerable experiment and trial should be made before universal application is considered. So far, our system has been restricted to systems equipped with expansion valves."

While the defrosting system described is admittedly in the developmental stage, the NEWS feels that legitimate efforts at solving the general problem should be described and circulated to the industry to help avoid duplication of effort and to foster a free exchange of information.

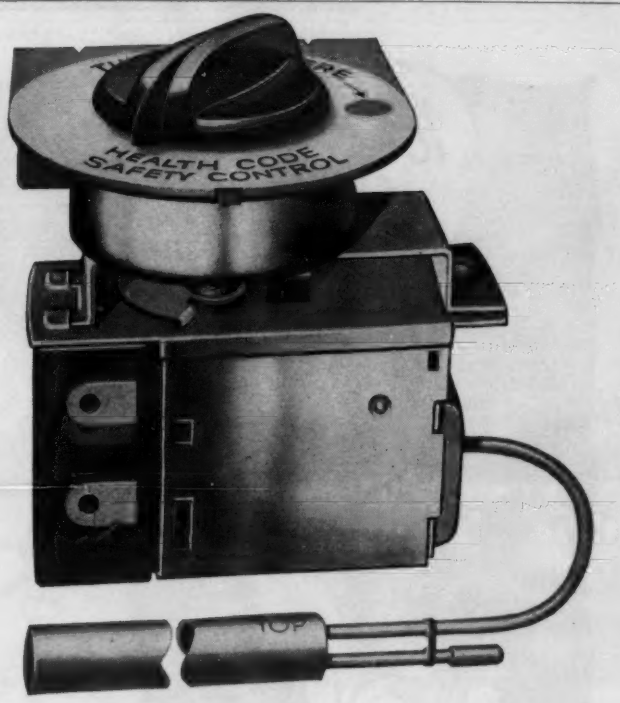
file guide—HEAT PUMP: defrost

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

NEW HEALTH CODE SAFETY CONTROL

for coin vending machines dispensing cold or hot items

RANCO F11



Recent changes in U. S. Sanitation Ordinance and Code suggest that vending machines with storage compartments for readily perishable food and beverage items be equipped with controls to insure maintenance of temperature *not higher than 50° F.* (cold items) nor lower than 150° F. (hot items). Only exception is a 30-minute recovery period following loading or servicing, after which time the system must have returned and be in normal temperature operation.

Ranco has developed two controls (F11-1000 for cold vending and F11-1200 for hot vending) which automatically prevent machines from vending food or beverages at unsatisfactory temperatures. They are in addition to, and do not interfere with, the regular cycling thermostat required in the machine.

PRESCRIBED SAFETY VALUES

F11-1000 (cold vending): prevents mechanism from dispensing when refrigerated compartment temperature rises to 50° F. or above.

F11-1200 (hot vending): prevents mechanism from dispensing when heated compartment temperature drops to 150° F. or below.

30-MINUTE RECOVERY PERIOD: Both controls have a 34 (±4)-minute time range, non-adjustable.

OPERATION OF THE CONTROL

The F11 Control is a semi-automatic type with manual reset mechanism responding to temperature change and is equipped with a mechanical, spring-wound timer as a component.

AUTOMATIC FEATURE of the control prevents coin mechanism from dispensing items when temperature of the compartment reaches the prescribed safety setting.

MANUAL FUNCTION is through the mechanical timer (not made by Ranco). Dial knob must be turned to an indicated stop to start the timer after loading or servicing. An actuating cam-push bar mechanism closes the contacts circuited to the machine so it will continue to dispense through the fixed 34-minute recovery period. If the system does not recover to normal operating temperature, the push bar unlatches to prevent dispensing. If the system recovers, the push bar remains latched and dispensing continues.

ALTITUDE ADJUSTMENT: correction provided for elevations to 8000 feet.

ELECTRICAL RATINGS: (Listed with UL and Canadian Standards Association) 115 volts a.c. non-inductive, 2000 watts, 7.4 amps. full load, 45 amps. locked rotor. 230 volts a.c. non-inductive, 1000 watts, 3.7 amps. full load, 23 amps. locked rotor.

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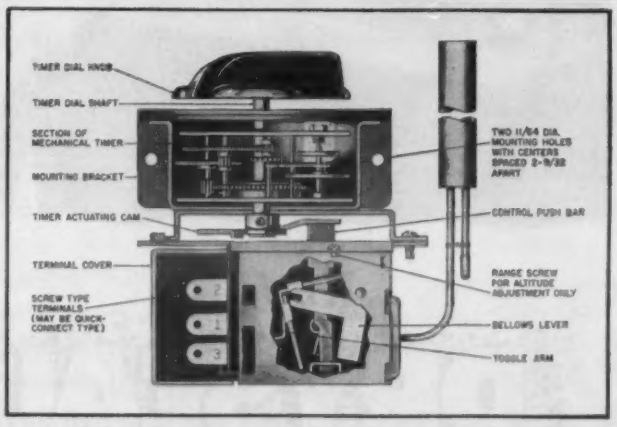

See your Ranco Distributor or write direct for complete, detailed Bulletin 1726 with wiring diagrams, technical data on F11 Series controls.

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ScottFoam Permanent-Type Air Filters Speed Room Air Conditioner Production

COLUMBUS, Ohio — "ScottFoam," an open-pore polyurethane foam developed by Scott Paper Co., is being used by Westinghouse Electric Corp. for permanent-type air filters in all 37 models of its 1960 "Mobilaire" air conditioners, one reason being that the material is found to be well suited to mass production methods.

(This is one of a continuing series of articles dealing with manufacturing processes and methods which are proving themselves in plants in our industry.)

"ScottFoam is cut by the Merryweather Foam Latex Co., Akron, Ohio, to one size and shape which fits all 37 models," it was pointed out. "The filters measure 23 in. long, 7 in. wide, and have an 11-in. truncated cut-out along one edge for the control panel area. They are ¼-in. thick and have 30 pores per in. They are shipped to Westinghouse in cartons of 700 filters each.

LEFT: J. P. Moffitt, department manager, room air conditioners, at the Columbus, Ohio plant of Westinghouse Electric Corp. shows the new grille used on all 37 models of 1960 Mobilaire air conditioners. Air is drawn through the grille and passed through a permanent ScottFoam filter.

SCOTTFOAM filters are pre-cut to facilitate production of grille panel assemblies for Mobilaire room air conditioners. Filters are snapped quickly into place with metal and plastic clips that are attached to the inside of every grille. ScottFoam is said to be non-allergenic and lint-free. Employes therefore are not exposed to any irritant particles or dust during assembly operations.

"Air conditioner grille panels are assembled and fitted with filters in a continuous operation that requires only a few simple steps. Molded plastic louvers are secured with swivel springs to the steel frame of a grille. This is followed by attaching the perforated metal grille piece to the frame with thermoplastic studs which are 'peened over' with heat.

"Metal clips are inserted at the top edge of the frame and five plastic snap-down clips are attached to the bottom. The assembler takes a pre-cut ScottFoam filter, slips it under the metal clips and secures it snugly with the snap-down clips. This prevents air leakage around the perimeter.

"The entire assembly — grille and filter — is placed on a packing board which is inserted in a carton containing a completed unit. The front panel is installed by the dealer, serviceman, or the buyer."

ScottFoam for the Westinghouse filters contains two special ingredients, it was pointed out. A special chemical additive inhibits germicidal growth in the foam, and chlorophyll provides a freshening effect on air passing through the filter.

"Consisting of a series of urethane strands closely connected in a skeletal structure, ScottFoam is stable under all normal conditions of airflow and temperature," it is claimed. "Ninety-seven per cent of the mesh-like structure is void volume in which particles and organisms are retained until the filter is washed.

"Extensive tests by Westinghouse reveal that the filters are easy for the user to handle and install. They can be washed in soap and water, are resistant to all common detergents and cleansers, and are non-shrinking.

"After washing, a filter can be wrung out like a sponge and reinstalled immediately. The foam does not mat or separate to form open channels, even after repeated washings."

Baltimore Aircoil Names J. H. Morris

BALTIMORE — John H. Morris has been appointed industrial engineer for Baltimore Aircoil Co., Inc., it was announced by W. Donald Geiser, production manager.

During World War II Morris served as technician for the Army, installing factories in various countries of the Middle East. Following this he became a methods engineer for three years with York Corp., and then handled equipment sales for Nat. Elec. Welding Machines.

In his new position, Morris will work on production methods including tooling and material handling.

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Michigan State University Study

Refrigeration Losses Through Open Doors And Conveyor Passes (3)

Robert M. Williams, T. I. Hedrick, Carl W. Hall
Departments of Dairy and Agricultural Engineering, Michigan State University

The results obtained by a count of the number and length of time the cooler doors were open gave evidence that traffic was quite heavy. Based on an eight hour operating day, the doors were opened an average of 33 times per hour or slightly more than once every two minutes.

MUCH TRAFFIC WAS UNNECESSARY

Much of the traffic was unnecessary and with proper cooler supervision should be lessened. Often the cooler was used as a shortcut for employes to go from the processing area to the loading docks. In other cases the cooler was used as a "break" room for employes to drink a bottle of milk.

Route drivers also contributed greatly to the cooler traffic going in and out to explain an order to the cooler man or to assist him in assembling an order. Another factor contributing to heavy traffic was filler operators going in and out to determine the number of units filled by their respective operations.

The length of time conveyor doors were open was also out of proportion to the number of trucks being loaded out of the cooler as shown in Table 3. Once again this was largely a problem of supervision. In the procedures section it was stated that conveyor doors were considered open when the metal flaps used in the doors were not closed. The flasp were equipped with springs which would close them after a can or case passed through, but quite often the springs allowed the flap to remain open.

Another observation was that the cooler man, rather than lift a can from the conveyor and then pick it up again when trucks were ready to be loaded, would allow the cans to feed out of the cooler the full length of the conveyor which would hold the flaps open often for two hours at a time.

There was a prevalent idea that considerable savings of refrigerated air could be obtained by automatic control of circulator fans so that when the door is opened the fan is turned off. The assumption was that the fan blows the cold air out of the cooler. This technique in various forms is in common use in many dairy plants. However, the results shown in Figs. 2 and 3 do not substantiate that assumption.

The rate of air flow into or out of a cooler depends on the pressure difference between the inside and outside. This pressure may be the result of either air velocity or differences in density between inside and outside air, density being dependent upon temperature and humidity.

It will be observed from Figs. 2 and 3 that as the doors were opened, rate of loss was greater when the circulator fan was off, but immediately the rate began to decline. This was because air circulation past the evaporator coils was reduced, thus allowing the temperature to increase rapidly.

The higher rate of air flow from open doors when the circulator fans were off, Table 3, was probably due to the counteraction or turbulence which the circulator fan created inside the cooler when it was in operation. The turbulence helped to reduce the rate of air flow from the cooler.

Figs. 4 and 5 support Farrall's (2) statement that conveyor passes should be located several feet above the floor. The greater efficiency of the conveyor pass located 30 in. above the floor is probably à combination of two factors: (a) cold air naturally falls and moves along the floor. If little or no resistance to flow is encountered, as was true with can passes 10 in. above the floor, the outward flow of air is much greater, and (b) the 30 in. pass was located nearer to the neutral zone, which was created by the stack effect, thus there was less pressure difference because of temperature variation between inside and outside air.

Velocity of air flow from passes located 30 in. above the floor was only 96 f.p.m. while the velocity from passes 10 in. above the floor was 160 f.p.m.

Results obtained using the nylon curtain were conclusive as to their benefit in reducing refrigeration losses. Even with heavy traffic into and out of the cooler for 20 minutes, only a slight temperature fluctuation was observed. The temperature would increase one or two degrees and then drop back to the starting temperature which was no more fluctuation than that of the normal refrigeration cycle.

The only noticeable effect produced by the curtain was a shorter and much more frequent refrigeration cycle showing an increase of about 77% over regular operation. The rapid cycle indicated that the compressor had to work harder to maintain the desired cooler temperature when the curtain was used alone than when the regular door was used.

RUBBER STRIPS HELPED

Rubber strips in conveyor passes also appeared to be very effective in reducing refrigeration losses, at least when diffusers were used and there was no direct blast of air against the strips. Another advantage of using strips could be reduction of moisture flowing into the cooler. It was observed that ice had formed on some of the strips indicating moisture collection which could reduce frosting inside the cooler. This could also be a disadvantage because the ice formation might prevent proper hanging of the strips and lessen their efficiency in reducing refrigeration loss.

The diverted air flow technique used in conjunction with blower type evaporators appeared to be a very economical means of increasing refrigeration efficiency by controlling direct losses through open doors and also by reducing compressor operating time. At today's prices, the cost of construction of the duct would be approximately $25.

Savings in rate of air loss amounted to 80% when compared with losses from open doors both circulator fans on and off. Compressor operating time was reduced by approximately 20% during non-usage periods. This could mean considerable savings on total refrigeration cost, as each compressor could handle a greater load without increased wear and tear on the unit.

Cost per door opening was calculated as follows:

$$(\$0.06)\ (951)\left[\frac{5.2}{60}\right] \div (12{,}000)$$

$$= \$.0004$$

$\$0.06$ = Cost per ton-hour
951 = B.t.u. loss per min.
5.2 = Seconds open each opening
60 = Seconds per minute
12,000 = B.t.u. per ton-hr.
$\$0.0004$ = Cost per door opening

CONCLUSIONS

1. Losses through open doors used for test were greater when circulator fans were not operating than when the fans were being used.

2. Nylon curtains were beneficial in maintaining desired cooler temperatures during heavy door usage, but required that the compressor operate longer to maintain temperatures during non-usage periods than when a regular door was used.

3. Overlapping rubber strips were effective in reducing losses from conveyor passes.

4. The diverted air flow was beneficial both for reducing refrigeration losses from open doors and also reducing compressor operating time during non-usage periods.

5. Actual cost of losses per door opening was small when considered as individual units.

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(8) Turnbow, G. C., Tracy, P. H., Raffetto, L. H., **The Ice Cream Industry**, 2nd ed., 557, John Wiley & Sons, New York, 1947.
(9) Weller, C. T., Characteristics of Thermocouples, **Gen. Elec. Review**, 49; 11, 50, 1946.
10. **Heating, Ventilating, Air Conditioning Guide**, 35; 244-245, American Society of Heating and Air Conditioning Engineers, New York, 1957.
(11) Thermocouple Alloys, Electronics, 21; 6, M-27, 1943.
(12) A Curtain to Help Maintain Temperatures In Local Refrigerated Delivery Trucks, **Marketing Research Report**, 176, U.S.D.A., 1957.
(13) Only A Stream of Air Keeps Unwanted Weather Outside, **American Milk Review**, 19; 6, 125, 1957.

(The End)

SNIFTER KEEPS

KEROTEST®

QUALITY UP TO SNUFF!

LEAKPROOF CONSTRUCTION

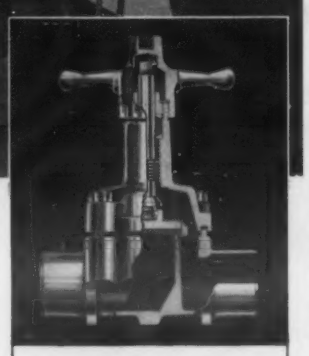
By passing the probe of this electronic leak detector along the joints and seams of the valve, the Kerotest laboratory technician can spot a leak as minute as 1/100 of an ounce per year. To simulate actual in-line use during the test, the Kerotest packed globe valve being checked out here is fed a tracer gas and subjected to 290 psi.

Kerotest employs more than a half dozen routine quality control tests on raw materials and in manufacture and final valve assembly. It's one of the important reasons why Kerotest valves last longer, perform more efficiently and economically.

•

ASK FOR KEROTEST VALVES AT YOUR LOCAL WHOLESALERS

KEROTEST MANUFACTURING CO.
2502 Liberty Ave. • Pittsburgh 22, Pa.



KEROTEST R12
PACKED GLOBE VALVE

The high quality brass valve for all types of refrigeration and air conditioning systems, nitrogen, oxygen (degreased), compressed air and liquefied petroleum gases.

Specify and use the R12 packed globe valve for operating pressures up to 500 psi and temperatures up to 200° F.

KEROTEST QUALITY CONTROLLED FEATURES

- Generous areas assure ample flow
- Swivel type self-compensating seat
- Leak-lok bonnet design
- Repacks under pressure
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- Quick seating disc for easy operation

R12 series ⅜" through 2½" forged brass
R10 series 2½" through 4½" cast brass

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BLAST

SCALE... SLIME... SLUDGE...ALGAE

but SAVE the EQUIPMENT!

For Easier Work . . .
More Satisfied Customers . . .
DEMAND . . .

VAPCO SCALE REMOVER
The SAFE cleaner in powder form!

VAPCO-HIB
For those who "Make Their Own" cleaner!

VAPCO-PHOS NUGGETS
To keep cleaned jobs really clean!

VAPCO SLIME-X
To knock out algae and slime!

VAPCO Ice Machine Cleaner
Safe for all makes and models!

Complete literature on request or see your dealer—TODAY!

Vapco QUALITY PRODUCTS

Complete literature on request or see your dealer TODAY!

GARMAN COMPANY
ST. LOUIS 25, MO.

Flexible Duct Row Tie Up--

(Continued from Page 1, Col. 5)

order had been signed earlier by Federal Judge Edward J. Dimock on a motion by the NLRB. The Labor Board claimed that the strike was an illegal secondary boycott under the Taft-Hartley Act. Judge Dimock had set Tuesday, April 5, as the date for a hearing on the injunction.

The union refused to send 300 strikers back to work. Samuel H. Cohen, lawyer for the union, claimed the walkout was not a secondary boycott, but a "lawful one of protecting jobs."

Triangle Sheet Metal Works had asked the NLRB to move for the injunction. In another action, it filed a $5,000,000 damage suit in Federal Court against Local 28.

The company asked $2,000,000 for the violation of contract and $3,000,000 for violation of the secondary boycott provisions of the Taft-Hartley Act.

Triangle accused the union of calling strikes on more than 20 big building projects as an outgrowth of a dispute over the use of labor-saving flexible metal air duct in one structure. It claimed it also has had to abandon plans for an immediate start on air conditioning work in seven other buildings.

According to Triangle counsel Burstein, the walkout started because of the union's refusal to install the disputed materials on the interior air conditioning system of the First National City Bank building under construction.

When Triangle refused to substitute rigid duct, Burstein said, Local 28 ordered 80 members to halt work at the company's fabricating plant in New Hyde Park. Also, it issued strike instructions to 330 other Triangle workers employed at construction sites, he stated.

A similar situation arose last December over the use of flexible metal hose and spiral pipe on two other big projects, it was pointed out by Seymour Zwerling, executive vice president of the company. Zwerling said a showdown had been averted when the union decided to send its members back on the job after Triangle filed a complaint with the NLRB.

According to Zwerling, the disputed materials are turned out by modern machinery by Carrier Corp. and the Wiremold Co. Though these materials are specified in the engineering plans for the buildings, he stated, the union insists it will install only the ducts which its members produce by hand in a contractor's own shop.

Triangle's damage suit asserted that the union had refused, despite provisions of its contract with Triangle, to submit the question of the disputed materials to grievance procedure or arbitration.

A curious aspect of the situation, Zwerling said, is that the spiral pipe, made in a Long Island City plant of Carrier, is produced by members.

He said that other contractors, working on ducting near the outer walls of new buildings, have been permitted by the union to use the new materials. It is only on the work for interior rooms, which Triangle is doing, that objections were raised, he declared.

Zwerling said the union is demanding the right of "engineering review" of specifications for construction it will agree to work on. In the case of flexible hose, he said, the plans now specify a non-rigid material, but the type of ducts the union insists on installing do not meet the requirement.

Before Judge Dimock issued the back-to-work order, the executive board of the Sheet Metal Workers International Association appealed to Local 28 to end the walkout. At that time, spokesmen for the local reportedly indicated they would disregard the appeal.

These spokesmen continued to contend that the new materials were being installed in violation of an industry-wide agreement. However, employer spokesmen denied there was any commitment governing use of the materials.

Worthington Sets Up Wholesale Operation In Washington, D. C.

HARRISON, N. J. — D. J. Michelson, Washington zone manager of Worthington Corp.'s Air Conditioning & Refrigeration Div., announces the establishment of a direct factory wholesale operation headquarters in Washington, D. C.

Supervising the new wholesale operation will be T. J. Driscoll, who has been Worthington's representative in this region for the last three years.

Michelson said this reorganization will offer better service and more flexibility to air conditioning dealers and contractors. Worthington will provide application engineering and service assistance, local warehousing, and closer contact, it was stated.

Airtemp Depots--

(Continued from Page 1, Col. 1)

sell parts to distributors except in certain instances where distributors do not stock parts. In such instances, the non-stocking distributor's dealers will be assigned to the nearest depot. Each depot will be independent and will not be aligned with a product outlet.

"Our new parts depots will be staffed by professional service people and will be in direct support of our sales distributors," Ogden said.

The depots will be located in Washington, D. C., Atlanta, New Orleans, Memphis, Detroit, Chicago, Kansas City, Phoenix, Dallas, Los Angeles, Dayton, and New York, which will have two depots.

Some of the other advantages which Airtemp sees in the new parts depot plan:

1. Faster delivery of parts to customers.
2. A central location in major trading areas which will become familiar to distributors, contractors, and independent servicemen as the headquarters for Airtemp parts.
3. Lower freight rates, since the parts will be f.o.b. from the depot, not Dayton.
4. Lower investment for parts inventory by Airtemp distributors and dealers, who will have a stocked depot nearby.
5. Depots can stock parts according to the actual sales requirements in their market.

Give your customers an

EXTRA DIVIDEND in Product Reliability

...with KLIXON Refrigeration CONTROLS

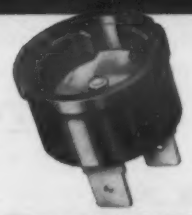
The extra reliability provided by Klixon Controls has been proven by the millions of them installed by manufacturers in hermetic compressors, refrigerators, air conditioners, freezers, heat pumps, etc.

The reason . . . Klixon Controls reduce costly service calls, repairs and replacements. They help build customer acceptance through product reliability reputation by permitting compressors to operate safely at maximum capacity . . . by assuring long compressor and equipment life.

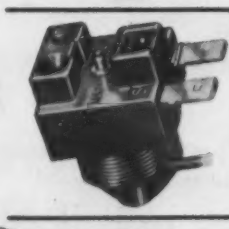
Why not investigate the advantages of Klixon Refrigeration Controls. Write for information today.

Over 200,000,000 KLIXON Controls are in use in refrigerating and heating equipment.

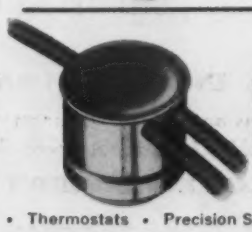
TEXAS INSTRUMENTS
INCORPORATED
METALS & CONTROLS DIVISION
2404 FOREST STREET • ATTLEBORO, MASS.



KLIXON DOME MOUNTED PROTECTORS* . . . permit maximum safe compressor performance under overload conditions . . . shut the motor down when maximum allowable winding temperature is reached . . . automatically restart it when operation can be continued safely.



KLIXON MOTOR STARTING RELAYS* . . . complete the combination required to start and protect compressor motor. This positive action over a wide range of voltage and long life eliminates starting troubles.



KLIXON SEALED THERMOSTATS . . . give reliable temperature control unaffected by frost, moisture, altitude or cross-ambient effect . . . available for heating or cooling applications.

*Replacements are now available through distributors.

Sponcor Products: Klixon® Inherent Overheat Motor Protectors • Motor Starting Relays • Thermostats • Precision Switches • Circuit Breakers

Michigan Heating Contractors' Convention

Costs of Owning, Operating Home Cooling, Silver Shield's Impact Discussed at Meeting

(See related story on page 11)

GRAND RAPIDS, Mich.— Silver Shield programs and costs of owning and operating residential air conditioning were among the topics touched upon in the two-day meeting marking the 49th annual convention of the Michigan Heating & Sheet Metal Association here March 10-11.

Considerable audience interest was aroused in the discussion of Silver Shield programs presented by Richard Von Munkwitz, assistant director of public relations for National Warm Air Heating & Air Conditioning Association, in cooperation with three officers of local Silver Shield bureaus: Harold Guernsey of Kalamazoo, Joseph Sloane of Lansing, and Bryan French of Pontiac.

Number of Silver Shield Systems Small but Impact Is Considerable

Number of Silver Shield systems being installed is still small, but the impact of the program on the local markets is considerable, implied the panelists.

An $80,000 house in the Lansing area, which he said "would surely have gone hydronic, has been planned for a Silver Shield system employing two forced air furnaces and two electronic air cleaners," Sloane disclosed as an example.

In Kalamazoo a homeowner who wanted his heating plant converted to a Silver Shield system but objected to changing his inside wall registers to perimeter location was sold a $1,000 furnace replacement installation by Guernsey because the prospect was convinced "you Silver Shield contractors must know what you're doing," Guernsey said.

The Silver Shield program is now active in 15 cities, either in actual operation or in the dealer training school stage, Von Munkwitz pointed out.

A broad, general discussion of residential air conditioning was presented by Joseph A. Cerny of the Westinghouse Air Conditioning Div. After briefly reviewing the types of systems available, Cerny offered some admittedly "rough figures" on installation and operating costs that could be used in qualifying prospects.

In a new home, he said, a contractor could assume an average of about 50 cents per sq. ft. for an air conditioning system (75 cents per sq. ft. in an existing home), which would work out to about 35 cents per day cost over the term of most present-day mortgages for a year-round system.

Operating cost during the cooling season, Cerny suggested, could be perhaps 50 cents a day at a power rate of 1½ cents per kwhr.

"This is a total owning and operating cost of less than $1 per day for cooling, and you can't drive to the beach for just $1 a day," he emphasized.

Contractors Advised To Appeal to Wife with Health and Comfort

Opening event in the association's convention was a luncheon featuring George F. Taubeneck, editor and publisher of AIR CONDITIONING, HEATING & REFRIGERATION NEWS, who advised contractors (and the industry generally) to aim at the housewife in selling year-round residential air conditioning by stressing how it can improve the comfort and health of their children and husband.

Continued growth of LP gas applications for space heating was predicted by John Kelderhouse, a field secretary for the LP Gas Association, who declared that present users of LP gas space heaters should be excellent prospects in the future for central heating.

The contractor can either work closely with the local LP gas dealers or locate such prospects just by spotting LP gas tanks beside homes, Kelderhouse said.

Outlook for Natural Gas Systems Outlined

The outlook for natural gas heating and air conditioning systems in Michigan was reviewed in another talk by Douglas Watkins of Consumers Power Co., who assured contractors that the utility has "no intention of getting back into the sale of gas space heating equipment."

The company's lines have only 56% saturation of gas heating customers, Watkins also said.

In a discussion of atomic energy as applied to purposes other than "the bomb," Robert W. Hartwell, general manager of Power Reactor Development Co., devoted most of his talk to descriptions of the two atomic power generating plants now under construction in Michigan, one near Monroe, the other near Charlevoix.

The latter plant, he indicated, may produce power economically in its lifetime; the other, designed primarily for test purposes, probably never will.

Contractors were urged to cooperate with utilities in the latters' promotion of electric heat by Coit Lytton, sales manager of Lennox Industries, Inc., "if you don't want to watch our business go down the drain."

Pointing out that "Lennox is going to have coal, gas, oil, and electric furnaces," Lytton said that contractors will also have to be prepared to handle equipment for all four fuels.

Lennox, he said, will have not only an electric furnace for central installation but registers containing electric heating elements which can be installed for individual room thermostat control in a ducted system which also provides air movement and filtration plus being readily adapted for central cooling.

"We don't think the electric registers will win out over the central furnace, however," Lytton predicted.

Contractors were cautioned by Lytton that electricity as a fuel has never been sold as being cheaper, so the lower costs of other fuels cannot be used as an argument against electric heat with the prospect who's already been sold on the latter.

"Electricity is sold as being more convenient," he emphasized. "And when you work with electric utilities in selling electric heat, be sure not to try to sell the prospect on another fuel," he warned.

"Let's don't fight it," he urged; "join it."

Some practical suggestions on sales methods and techniques were offered contractors by E. J. Van Fassen of Temco in a discussion entitled "Sell for Keeps."

To obtain prospects, dealers

(Continued on next page)

WORTHINGTON CORPORATION

AIR CONDITIONING AND REFRIGERATION DIVISION

EAST ORANGE, NEW JERSEY

Rapidly expanding operation and accelerated product development programs have created exceptional opportunities for qualified men.

WANTED

- SALES ENGINEERS
- SALES ENGINEERS IN TRAINING
- PRODUCT ENGINEERS
- APPLICATION ENGINEERS
- TECHNICAL WRITERS
- EXPERIENCED DESIGN ENGINEERS (For Induction Units)
- EXPERIENCED DESIGN ENGINEERS (For Rotating Machinery)
- DESIGN AND LAYOUT DRAFTSMEN (For Sheet Metal, Machinery and Heat Exchangers)

Opportunities for permanent association with one of the most progressive, experienced manufacturers in the world.

Geographic selections possible—liberal health insurance and retirement programs.

ALL INQUIRIES CONFIDENTIAL

Send qualifications and salary requirements to Mr. P. H. Shaw, Worthington Corporation, AC&R Division, Ampere Station, East Orange, New Jersey.

LOCAL INTERVIEWS ARRANGED

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS WANTED

REGIONAL MANAGER now with a national organization desires position with a small heat pump manufacturer as national sales director or equivalent position. Approximate salary $15,000 plus incentives. Write: BOX A6522, Air Conditioning, Heating & Refrigeration News.

POSITION WANTED as chief engineer, supervisor, or project engineer in research, development, design, or application of advanced concepts in refrigeration, heating, air conditioning, heat pumps, etc. Have 30 years of comprehensive technical and practical experience in these fields including low temperature, and automotive air conditioning. B.S.E.-Mechanical. BOX A6526, Air Conditioning, Heating & Refrigeraton News.

POSITIONS AVAILABLE

WOULD YOU like to live in California? We need experienced Countermen for wholesale refrigeration & air conditioning sales. Write giving age and experience, salary desired. REFRIGERATING & POWER SPECIALTIES CO., 380 Brannan St., San Francisco 7, Calif.

WE ARE ready to add a district supervisor to our growing factory field sales organization. We can show records of earnings to convince you that in exchange for a good job done there's nothing better in the industry. The man we want must have sold to food chains, supers and wholesale grocers and be able to supervise a dealer organization. Write brief resume of experience to: SHERER-GILLETT COMPANY, Marshall, Michigan.

SMALL MANUFACTURER of heat pumps (located in Los Angeles) has immediate opening for potential general manager. This position with a financially sound company represents a great challenge with commensurate salary opportunities. Write: BOX A6471, Air Conditioning, Heating & Refrigeration News.

SERVICE ENGINEERS—Major organization has openings along Eastern seaboard for top flight air conditioning service and installation men. Only heavy experience with industrial equipment and control systems considered. Top rates with excellent opportunities to advance to management. Replies confidential, submit full details of experience to: BOX A6506, Air Conditioning, Heating & Refrigeration News.

LABORATORY TECHNICIAN required to set up and run code tests of heating and refrigeration equipment. Excellent opportunity with leading manufacturer located in the Southeastern states now expanding its test facilities. Write giving technical background, experience, and salary desired. BOX A6512, Air Conditioning, Heating & Refrigeration News.

SHOP SUPERINTENDENT wanted by Florida manufacturer of quality heating and air conditioning equipment. First class assembly line production man capable of expediting construction and ability handle employees—must be cost conscious. Small but fast growing corporation with unlimited potential. Opportunity to advance—salary open. Send complete background, age, education, etc. to: BOX A6516, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION SERVICE Manager wanted by old established Florida contractor. Must be capable of servicing all types of heating and air conditioning equipment, organizing and operating service department at profit and handling customer relations. Send complete resume of education, age, experience, and reference to: BOX A6517, Air Conditioning, Heating & Refrigeration News.

AIR CONDITIONING Sales Engineer wanted by well-established Florida contractor handling highest quality equipment for past 15 years. Must be graduate Mechanical Engineer, pleasing personality, capable of selling quality installations. Earnings limited only to ability and initiative. Send resume, photo, complete details to: BOX A6518, Air Conditioning, Heating & Refrigeration News.

MANUFACTURERS' REPRESENTATIVE contacting consulting engineers, mechanical contractors, architects, and heating and air conditioning engineers in large commercial and industrial installations and distributors to represent established manufacturer of air filters. Products represent advanced solutions to filtration problems and offer repeat volume opportunities. Several good territories now open. Only representatives well established and representing quality products considered. BOX A6523, Air Conditioning, Heating & Refrigeration News.

DEPARTMENT MANAGER for Cincinnati wholesaler of refrigeration and heating supplies. Must be experienced and able to direct full activity of department. Liberal salary and incentive. Please submit complete resume to: BOX A6524, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

WANTED: MODEL QT-5 Kennard fiberglass encased "water savers". Cooling towers—must be new—advise the quantity you have—price and shipping point. Write or call: JOHN H. COUSE INC., 308 Fern Street, West Palm Beach, Florida. TEmple 3-4453.

EQUIPMENT FOR SALE

WATER COOLERS, electric. Manufacturer's closeout due to model change. Bottle type with refrigerated, stainless steel storage compartment. Tecumseh ⅛ h.p. hermetic unit, fan condenser. Attractive, sturdy. Complete with five-year warranty on hermetically sealed refrigeration circuit. $118.00 each subject to prior sale. REMCOR PRODUCTS COMPANY, 321 E. Grand Avenue, Chicago 11, Illinois.

ATTENTION REFRIGERATION Servicemen: Send for catalog listing values in refrigeration and air conditioning parts, relays, capacitors, compressors. Savings up to 50%. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE: Established commercial refrigeration service business, 30' x 45' block shop on large lot, shop tools, parts, 5 room new modern home adjoining lot. Good potential for household appliance sales and/or service, wiring, motor work. Ideal set-up for 1 or 2 servicemen. $22,000. Southwestern Ohio. Write to: BOX A6525, Air Conditioning, Heating & Refrigeration News.

Packaged Air Conditioners—Commercial and Residential

Package-Aire—United States Air Conditioning Corp., Delaware, Ohio

Model No.	Cabinet Dimensions (In.) Height	Width	Depth	Capacities (B.t.u.h.) Cooling	Heating	Evaporator Face Area (Sq. Ft.)	Rows Deep	Condenser Type	Water Usage Gpm/ton	Compressor Make	Hp.	Comp. Mfrs. Model No.	Kw. Input Total	Refrigerant Charge (Lbs.)	Control	Damper Control	Blowers No.	C.f.m.	Motor Hp.	Air Filter No.	Dimensions	Net Weight (Lbs.)
RK-10	61⅝	95⅝	37⅝	120,000	—	6.75	6	Evaporative	—	Copeland	10	9R9-1000	—	30	X Valve	—	2	4,000	1½	3‖	P 16x25x2	2,900
DRK-15	73⅝	114⅛	41⅝	180,000	—	10.1	6	Evaporative	—	Copeland	(2) 7½	MR50-750	—	45	X Valve	—	2	6,000	2	6	P 16x30x2	4,200
DRK-20	73⅝	114⅛	41⅝	240,000	—	13.3	6	Evaporative	—	Copeland	(2) 10	9R9-1000	—	60	X Valve	—	2	8,000	3	6	P 16x30x2	4,800
DRK-25	77⅝	135⅛	48⅛	300,000	—	16.5	6	Evaporative	—	Copeland	10, 15	9R9-1000, 4R48-1506	—	75	X Valve	—	2	10,000	5	6	P (2) 16x25, (2) 20x25	5,500
DRK-30	84⅝	127⅛	53⅛	360,000	—	18.8	6	Evaporative	—	Copeland	(2) 10	9R9-1000	—	90	X Valve	—	2	12,000	5	8	P (4) 16x30, (4) 20x30	7,000
RK-40	93⅝	148⅛	60⅛	480,000	—	25.0	6	Evaporative	—	Copeland	(4) 10	9R9-1000	—	120	X Valve	—	2	16,000	7½	8	P (4) 20x25, (4) 20x30	7,850
RK-50	105⅝	187⅛	60⅛	600,000	—	31.8	6	Evaporative	—	Copeland	†	†	—	150	X Valve	—	2	20,000	10	10	P 20x25x2	9,600
DRK-60	104⅛	218	65⅝	720,000	—	40.5	6	Evaporative	—	Copeland	(3) 20	4R48-2006	—	180	X Valve	—	3	24,000	15	18	P (6) 16x20, (12) 20x30	11,310

†(2) 15 hp. 4R48-1506 and (3) 10 hp. 9R9-1000. ‖Separate filter sections.

Home Cooling Costs

(Continued from preceding page)

were urged by Van Fassen to offer such things as a free humidifier check, free thermostat check, to contact local realtors with the offer to check heating systems, to contact fuel oil dealers, and even to conduct door-to-door canvassing.

"Take your office girl to see a completed job so she can accurately describe the kind of work you do in talking to other customers. After all, she probably talks to more people over the phone than you do."

After a sale is made, contractors would do well to set up a card file so that they would inspect the installation once or twice during the first year and then call on the customer a week before the first year's warranty expires, Van Fassen also said.

This should not only assure complete customer satisfaction but provide the opportunity of selling a service contract.

At the group's annual banquet Homer Brundage was presented with a plaque in recognition of his services to the association and industry over a period of many years.

Featured speaker at the banquet was Michigan Congressman Alvin M. Bentley, who, after a short formal presentation, took on all comers in a free-for-all question and answer session on national and international problems.

An unusual aspect of the convention was that the mayor of Grand Rapids, Stanley Davis, actually showed up to welcome the group as promised in the program.

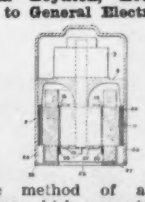
In the annual election Al Keats of Detroit was chosen president to succeed John De Haan of Kalamazoo. Joseph Sloane of Lansing is the new vice president, and Earl Oole of Grand Rapids continues as treasurer. Jay Biddle continues as executive secretary.

Directors include D. Cramer, H. Guernsey, M. Cole, J. Colomma, H. Bowie, and W. Jackson.

PATENTS

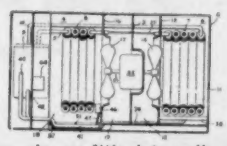
Week of Nov. 10

2,911,709. METHOD OF ASSEMBLING COMPRESSOR AND MOTOR. Erwin R. Boynton, Louisville, Ky., assignor to General Electric Co.



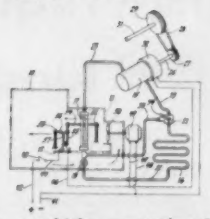
1. The method of assembling a compressor which comprises providing a substantially annular stator having an accurately dimensioned annular inner surface, providing a frame having an outer diameter approximately equal to the outer diameter of said stator and having a journal bearing with a drive shaft extending therethrough, said shaft having a motor rotor mounted upon one end thereof....

2,911,797. AIR CONDITIONING APPARATUS. George E. Stocking, Lyndon, Ky., assignor to General Electric Co.



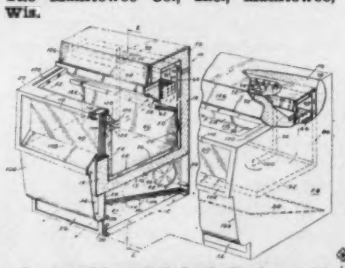
1. An air conditioning unit of the type adapted to be mounted in the wall of an enclosure to be conditioned comprising a casing, a refrigeration system in said casing including an evaporator, a compressor and a condenser connected in refrigerant flow relationship, means for circulating a first stream of air in thermal exchange with said condenser, means for circulating a second stream of air in thermal exchange with said evaporator, a condensate sump also exposed to said first air stream. . . .

2,911,798. VEHICLE REFRIGERATING APPARATUS. Richard E. Gould, Dayton, Ohio, assignor to General Motors Corp., Detroit.



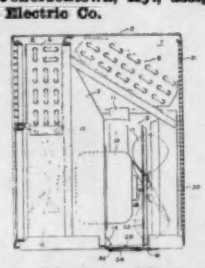
1. In a vehicle, an engine for propelling said vehicle, a refrigerating system carried by said vehicle for cooling air in a compartment thereof, said system comprising a compressor, a condenser, an evaporator and refrigerant flow connections therebetween, means for operating said compressor from said engine, means in said connections controlling admission of liquid refrigerant into said evaporator, a conduit in said system adapted to by-pass refrigerant discharged from said compressor around said condenser and said admission means directly into said evaporator. . . .

2,911,799. REFRIGERATED FOOD DISPLAY CABINET. Robert H. Guyton, Lima, Ohio, and Robert D. West, Manitowoc, Wis., assignors to Manitowoc Equipment Works, a division of The Manitowoc Co., Inc., Manitowoc, Wis.



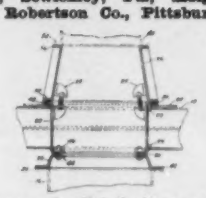
6. A refrigerated food display cabinet having a food storage compartment at the upper portion thereof and having a generally enclosed air space extending substantially throughout the length of the cabinet at the lower portion thereof, a partition dividing said air space into a compressor compartment and a condenser compartment, said condenser compartment having a relatively large air inlet opening at the front of said cabinet which extends substantially throughout the length of said compartment. . . .

2,911,800. ROOM AIR CONDITIONER CONDENSATE SUMP. Stephen L. McMillan, Jeffersontown, Ky., assignor to General Electric Co.



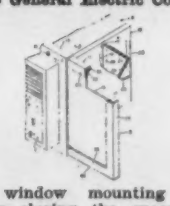
1. In combination with a self-contained air conditioner having a condensate water collection sump exposed to outdoor temperature conditions and including a water slinger extending into the sump, drain means in the bottom of said sump including a thermally responsive disk mounted in an opening in the bottom of said sump with the outer edge of said disk in water tight sealed relation with the edge of the opening. . . .

2,911,866. BUILDING AND AIR CONDITIONING STRUCTURE. Bernard E. Curran, Sewickley, Pa., assignor to H. H. Robertson Co., Pittsburgh, Pa.



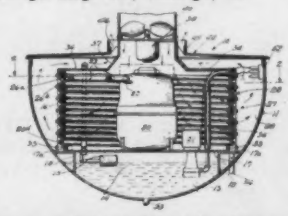
1. In an air distributing and building structure, a cellular metal load supporting floor having an air conducting cell forming a component of the floor, an air outlet unit for discharging air into the space above the floor, said unit being mounted on the upper side of the floor and spaced laterally from the air conducting cell. . . .

2,911,899. WINDOW CLOSURE FOR ROOM AIR CONDITIONER. William G. Spiegelhalter, Louisville, Ky., assignor to General Electric Co.



1. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connecting at their outer ends with a vertical member and arranged to move in a lateral plane toward and away from said case to encompass a variable space between said extension frame and said case. . . .

2,911,801. REFRIGERANT CONDENSING UNIT. Leon Buehler, Jr., Skokie, Ill., assignor to The Creamery Package Mfg. Co., Chicago, Ill.



1. A refrigerant condensing unit comprising a housing having substantially upright side sections and a bottom section cooperating with one another to form a liquid reservoir in a lower portion of said housing, means for maintaining a predetermined level of liquid within said reservoir. . . .

(To Be Continued)

* * *

UsAirco Specifications

DELAWARE, Ohio — United States Air Conditioning Co. last week submitted specifications data on its line of commercial packaged air conditioners which was not available at the time of the NEWS' Air Conditioning Showcase issue on March 7.

Readers who wish to keep their specifications information all in one place will find space on page 19 of the March 7 Air Conditioning Specifications section in which the above data may be pasted.

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Detroit Industrial Group Works on Wording For Space Heating Contractor's License

By George M. Hanning

DETROIT — Groundwork for the creation of a space heating contractor's license in the city of Detroit is currently being laid by a subcommittee representing all elements of the heating contracting industry here.

The subcommittee met for the first time recently to discuss proposed changes to the city's building code and gas and oil burner ordinance to permit the new classification.

Purpose of the move is to bring under city inspection the complete heating system and to provide a single permit to cover all types of heating, whether warm air, hydronics, or resistance.

The present gas and oil burner ordinance covers only the furnace itself and not the distribution system. Warm air heating contractor groups particularly are pushing for inspection of the complete heating system.

Representatives of 10 contractor organizations, four union locals, and the Federal Housing Administration attended the subcommittee meeting. The group is part of the city code study committee, which also includes city officials and utility representatives.

Each subcommittee member has taken the proposed amendments back to his organization for study.

On April 19, the subcommittee is scheduled to meet again to reconcile desired wording by the various groups and to prepare a working draft for the code study committee.

The group will meet in the headquarters of the Plumbing & Heating Contractors Association of Detroit, 17606 Wyoming Ave.

Al Cohen, secretary of the Plumbing & Heating Contractors Association of Detroit, and George Asher, secretary of the Better Heating & Cooling Bureau, are co-chairmen of the subcommittee.

Previous efforts to bring about similar code changes have floundered because of industry disagreement over the need for and form of the changes and by city reluctance to add to its present inspection work load.

Comments from several sources indicate that, if the industry can agree on the changes, they have a good chance of adoption by the city.

Contractors Defeat Move to Weaken Code

DETROIT—First attempt to water down the Residential Warm Air Heating Code of the Better Heating & Cooling Bureau here was beaten down recently by the board of directors of the Air Conditioning & Heating Contractors of Metropolitan Detroit.

The board voted 7 to 2 not to recommend to the trustees of the Better Heating & Cooling Bureau, administrator of the code, that provisions requiring vibration isolation connectors on both supply and return air ducts be dropped.

The board vote was considered significant because five of the board members are also trustees of BHCB and all are members of the bureau.

The heating code is not a municipal code. It was adopted more than a year ago by BHCB, which is an organization of warm air heating contractors devoted to cleaning up shoddy practices in the industry locally.

Members have pledged themselves to make all residential heating installations in conformity with the code.

George Asher, secretary of bureau, commented that the vote to retain the provisions indicated the bureau's seriousness of purpose in attempting to improve the general level of heating installations.

Asher indicated that association members seeking to drop requirements for vibration isolators felt they were an unessential expense for systems in lower priced homes.

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Air Conditioning Installed on Seven Ships Built Abroad

NEW YORK CITY — Seven large ships being built abroad for American interests will employ "Hi-Press" systems, it was announced by Hi-Press Air Conditioning of America, Inc.

Aggregating more than one-quarter of a million tons, the seven ships include two tankers each for Standard Vacuum Oil and Caltex Trading, one tanker each for Texaco and the Naess interests, and a bulk sugar carrier for the American Sugar Refining Co.

S. W. Brown, president of Hi-Press, said the seven ships will be built in shipyards in Denmark, Sweden, Belgium, Northern Ireland, and Japan. Foreign contracts announced earlier by HI-PRESS include ten tankers.

Bomanz Works Chicago Area for Henry Valve

MELROSE PARK, Ill. — Henry Valve Co. has named Carl J. Bomanz as a field engineer in a recent expansion of its sales force, it was announced by Charles V. Gary, general manager. Bomanz will work the greater Chicago Area.

C. J. Bomanz

Formerly with Alco Valve Co. as field engineer, Bomanz more recently operated as manufacturers' agent in the Midwest, working out of Chicago. Bomanz is a member of the American Society of Heating, Refrigeration & Air Conditioning Engineers, and Refrigeration Service Engineers Society.

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The McQuay Hot Rod Electric Defrost Unit Cooler gets its name from the brass sheathed calrod heating element which runs through the center section and rapidly defrosts the coil. Direct metallic contact between the brass sheath and the aluminum fins gives you more complete, trouble-free refrigeration with automatic electric defrosting. For information, call your McQuay representative, or write McQuay, Inc., 1607 Broadway Street N.E., Minneapolis 13, Minnesota.

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